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New Approaches to Human Geography Prehistoric Greece: A Case-Study

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In the prehistory of Greece, there are few studies that pursue the main theme of historical geography—the study of man's interaction with the landscape. Those that exist confine their analysis to general comments on the availability to early settlers of fertile plains, a plentiful water supply and strategic locations.

This chapter is an attempt to demonstrate how the techniques of modern geography and an interdisciplinary approach, applied to the extant remains of human settlement, burial and ceremony over the landscape, as recovered by archaeologists, can yield a significant body of information about the economic and social life of essentially illiterate communities.*

The Region and its Archaeological Sites

A compilation of archaeological sites recorded within a chosen region is the first preliminary to field examination. This sum-

* For clarity and general interest references have been kept to a minimum, and detailed argument omitted. The reader is referred to the writer's Ph.D thesis: *Natural Environment and Human Settlement in Prehistoric Greece*, submitted Cambridge University, 1975, published by British Archaeological Reports, 1976.

marizes the result of surveys of limited areas and with limited objectives, and frequently incorporates numerous chance discoveries. A consideration of the bias in local archaeology e.g. towards larger settlements or sites on prominent defensible hills, sites belonging to periods with easily recognizable pottery, reveals predictable gaps in the maps of sites plotted over time and space. It is reasonable to point out where sites tend to be, but a large sample and persuasive argument are required before one can say where sites tend not to be. Having selected an area, its total surface must be examined for its potential for prehistoric settlement, even if large sectors are devoid of known sites.

Locational Analysis and the Individual Archaeological Site

After excavation and the analysis of stratified floral and faunal remains, the fundamental approach to understanding the function of a particular archaeological site in terms of its immediate natural surroundings is based on the theory of locational analysis, originating from von Thünen and developed by Lösch, Christaller, Haggett and Chisholm. The archaeological application of locational analysis is especially relevant in the work of Higgs and Vita-Finzi and their school.¹

Not only are fields distant from a particular farming settlement of low 'value' and labour-extensive in their usage, but it is possible that a threshold exists, beyond which economic activity from the home base is barely viable. Further to this point only occasional visits are made with limited use of the resources. With little empirical justification, this threshold has been estimated at about the five kilometre mark in all directions from the agricultural base, ten kilometres with a pastoral or hunting group.

While there is much to criticize in these theoretical guidelines, and application of them requires continual modifications, several years of fieldwork in Greece and the examination of hundreds of site locations have convinced me of the essential truth of these propositions. In almost every case an archaeological site is closely associated with a local concentration of unique resources e.g. good soil, abundant seafood. Often a grading of resource zones conforming to the 'Land Rent' principle can be verified; a soil that is

easiest to work and highly fertile forming a first ring around the site, followed by less rewarding but not infertile soil, finally bounded by grazing land (Fig. 1).



FIG. 1. The modern village of Fournoi (circled asterisk) in the south-west Argolid, is also a key prehistoric site. A grading of land resources available within an hour's walk from the village reveals a characteristic falloff in both land quality and the intensity of agricultural effort. The territory outlined coincides broadly with the fields owned and worked by the village. Further examples of soil zonation around ancient and modern settlements may be found in Figs 2, 3, 4, 5 and 6.

Practical objections to the locational theory involve the criteria of locational values, and the existence of a threshold.

Purely economic considerations seem excessively limiting, and many locations are pre-eminently defensive, or notably well supplied with water resources. The Land Rent principle should surely be distorted by such considerations, especially in Greece where water is scarce, and amongst primitive groups where warfare is supposedly a commonplace activity. A site such as the Argos crag, the Mycenae crag, the Midea-Dendra mountain, the Mene-laion plateau, the Malthi hill, the citadel of ancient Melos—these places strike the eye without the need for historical proof, as fortress heights. As for water-supply, Lerna with its mighty

springs, Agios Stephanos and its source, Phylakopi and the great store of groundwater nearby, the proximity of the main sites in the Sparta Plain to the perennial Eurotas river—seem equally conclusive. But alternative explanations for these locations point to the priority of economic considerations, with some concessions made for example to defence (Figs 2A–C; for Phylakopi see Fig. 4C).

The Threshold Problem

The notion of a threshold to a village or farm territory is a reasonable hypothesis, but quantifying this is problematical. Higgs and Vita-Finzi made the necessary step in view of changing terrain, of replacing the 5 and 10 km radius with 1–2 hours walking distance, but the lack of practical proof for the threshold hypothesis should cause concern to locational practitioners. It seems advisable to seek independent evidence for the spacing of settlements.

Due to exhaustive research in the Late Bronze Age (LBA) pottery of southern Greece, a given style can be assigned to periods as brief as a century, often less. It is therefore possible to construct a map of settlements for a given area, where the proof of contemporaneity is almost certain. Significant patterns and spacings now become apparent, and intervening distances of 30 min, 15 min on foot are as frequent as between modern rural communities. Even the major centres exhibit a territorial radius of only 30 or 45 min, and this space contains lesser satellite communities.

More difficult to separate are the temporal and spatial elements in a map of sites where dating permits no closer limits than half a millennium (common in the Neolithic and the earlier part of the Bronze Age). However even here an examination of all the archaeological and topographical circumstances can indicate a strong possibility of contemporaneity, or exclusive territorial interests (e.g. Early Helladic and Early Minoan rural settlement discussed later). Again the maximum radius of an hour, is on a quite inappropriate scale, given the density and small size of the units of settlement over the landscape.

In all these cases considered, the solution that provides the most reasonable results is a modification of Locational Territorial Analysis, which I proposed, on the model of highland British

farm concepts: the In Territory and the Out Territory.

The dictum of E. S. Higgs, that the resources within a ten minute radius of an ancient site are crucial to its locational priorities, underlies the In Territory. Often resources beyond this inner zone are undifferentiated and of lower value; however, power centres in developed cultures such as the Mycenaean may dominate major arable resources from a secure or eye-catching height. Even here, though, the farming community almost invariably occupies a lower town adjacent to the fields.

But clearly a community is normally associated with a body of resources, such as game, seafood, arable and grazing land, which with all but the smallest units of occupation—the farmstead or temporary food-collecting site—requires a larger amount of landscape within its exploited territory. Once the widest reasonable limits of a site's territory are visited and the nearest neighbouring sites are taken into consideration, it is possible to point to a wider potential zone of exploitation—the Out Territory, and this is rarely more extensive in agricultural communities than an hour radius, generally much less. The one hour radius is still an heuristic device to be employed in the field wherever there is no evidence of the contemporary spacing of sites, provided that the site under investigation is of a village or town status. Experience shows that small sites or those of a temporary and seasonal nature exploit far smaller areas of the landscape, and often, with such cases as small fertile shelves, the exact confined zone can be isolated (Fig. 3).

In Fig. 4 we illustrate the 'explanation' of settlement patterns in terms of localized resources. It is clear that a correlation gains strength by repetition. The figures show good correlations of site patterns and particular soils, buried prehistoric coastlines and fishing grounds, (see also Fig. 9).

In the preceding pages, locational preferences exhibited by the individual archaeological site were analysed, using present day features of the landscape and the use made of it by present day rural communities. However, before applying these principles to a given region, we must allow for changes in the economic priorities and technological capacity of human cultures. It is equally necessary to allow for changes in the natural landscape over the time covered by the remains of human occupation.

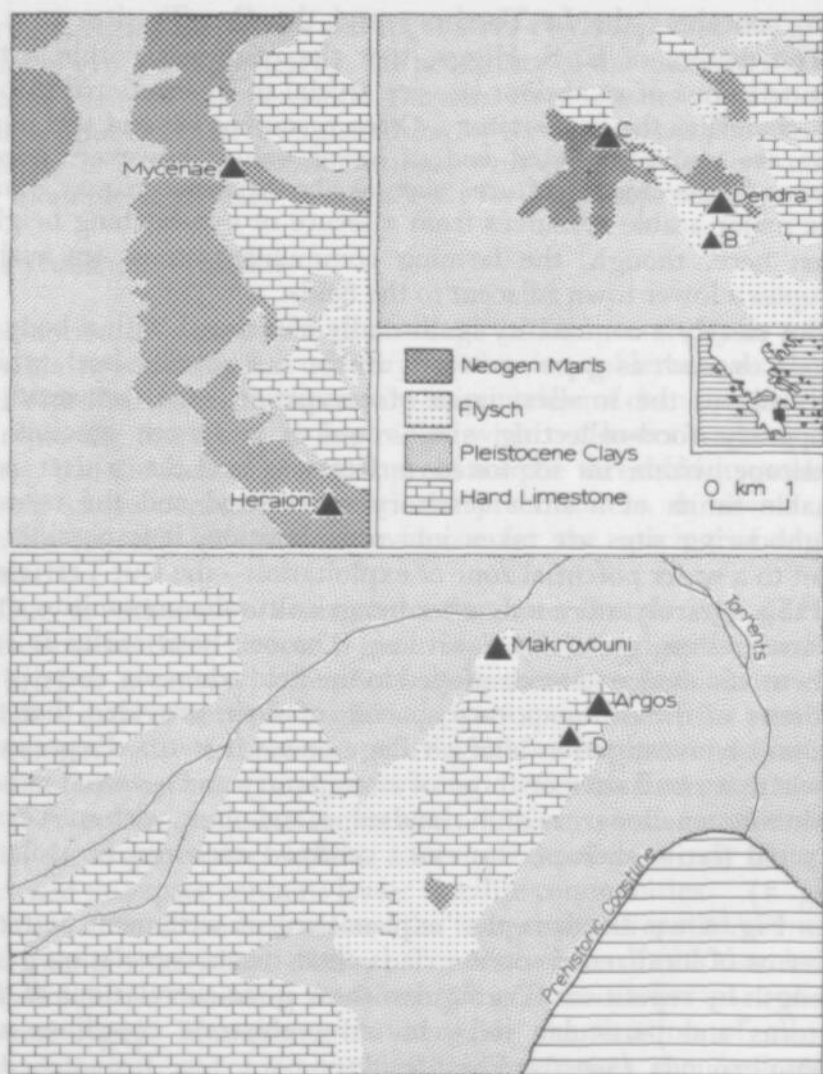


FIG. 2A. The locational preferences exhibited by some famous prehistoric sites. In the Argos Plain, the major early centres of Mycenae, Heraion, Dendra and Argos are in close proximity to the most fertile soils of the region (allowing for the landscape change as indicated)—the Neogen marls and the flysch, while further away the less rewarding Pleistocene clays and rugged uplands are to be found. Even if the citadel occupies an isolated limestone crag, the associated main settlement may be undefended and down amid the best land e.g. site C contemporary to the Dendra citadel, or site D contemporary to the Argos citadel. With the early settlements Makrovouni and Heraion the soil zoning seems to be explanation enough without defensive considerations.

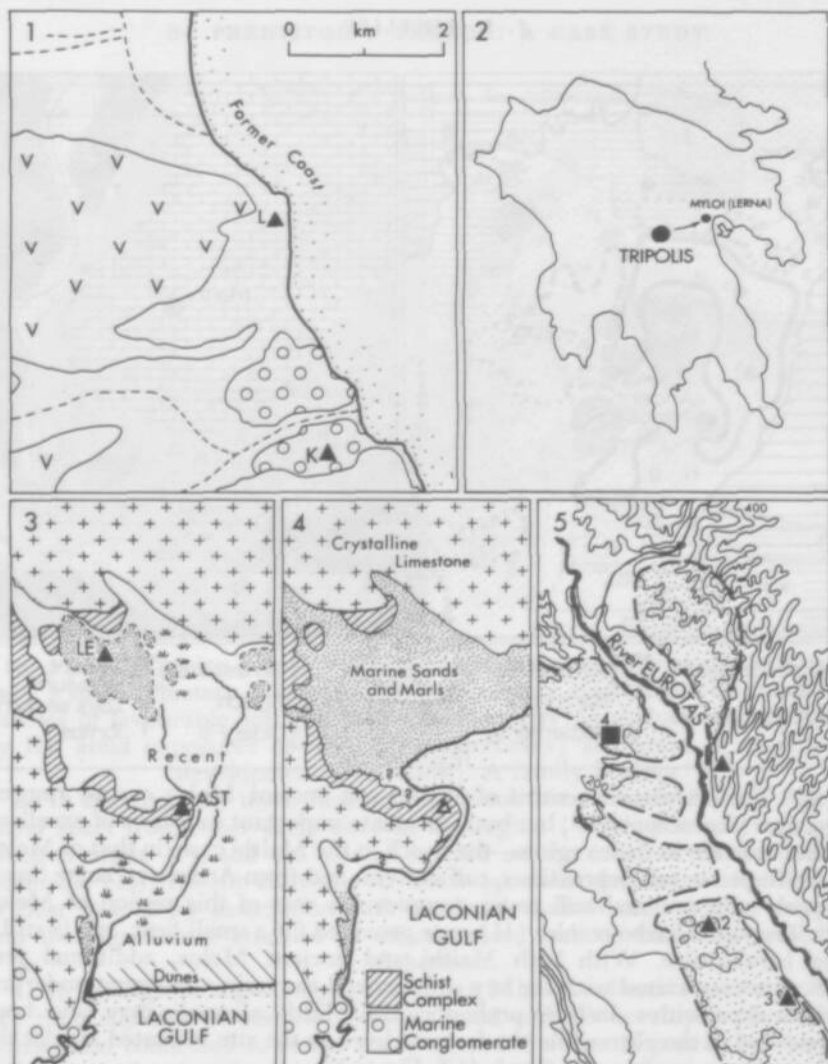


FIG. 2B. The important prehistoric sites of Lerna (L) and Agios Stephanos (AST) are illustrated in 1-4. V infil: hard limestone; circle infil: neogen marls; blank areas: Pleistocene clays; dashed lines: torrents. The present day landscape around Agios Stephanos is compared to that likely in the pre-historic period in 3 and 4. Allowing for that landscape change and that suggested for Lerna in 1 we may say that both sites were originally sites in favourable harbour positions. Notable overseas contacts in the finds of these settlements reinforce this locational evidence, and Myloi, the successor to Lerna (2) was at one time the major port for the Turkish capital of the Peloponnese at Tripolis. Major fishing grounds are likely to be at least as important at Lerna, and perhaps also formerly at Stephanos, while the proximity of significant areas of fine marl soils, in both cases, provides the agricultural basis. Contemporary, and partly contemporary sites amid this arable hinterland (K Kiveri; LE Lekas) are probably complementary locations or even seasonal settlements clearly linked to the main coastal site. In the upper Sparta Plain (5) the three largest settlements in prehistory, and Classical Sparta itself (sites 1, 2, 3 and 4, respectively), despite their proximity to the Evrotas river, and hilltop positions for all but Sparta (4), neatly divide up control over the soil zone of key fertility—the Neogen marl (dotted and enclosed).

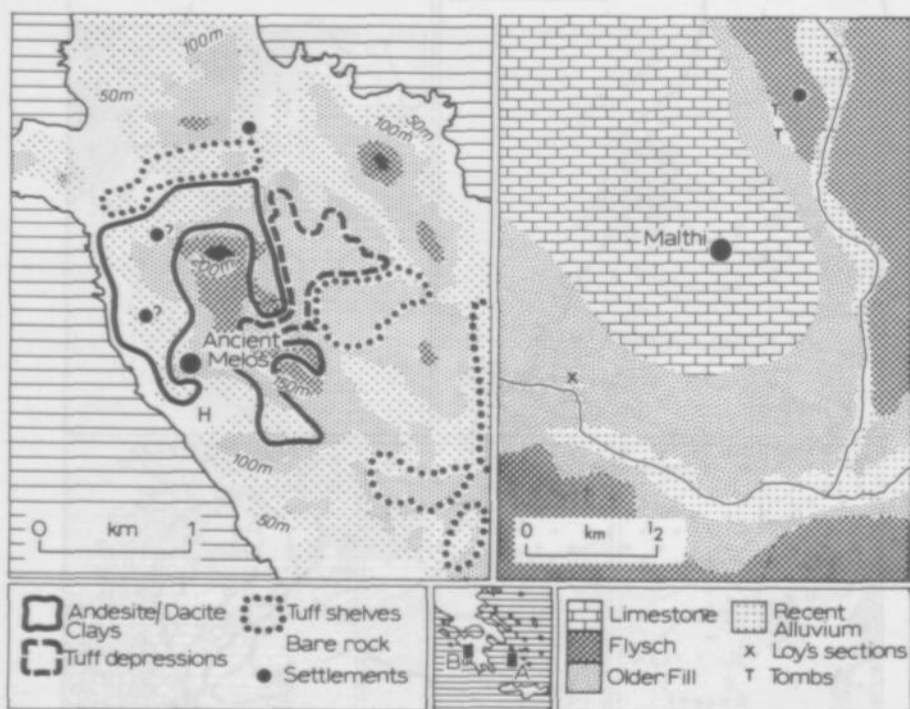


FIG. 2C. The prehistoric centres of Malthi and ancient Melos occupy rugged hilltop sites like 'acropoleis', but both dominate important expanses of excellent soils that are rare in their region—the flysch in the Malthi case, in that of Melos soils developed in tuff depressions, tuff shelves, and from Andesite/Dacite clays. Bare rock with minimal soil cover occupies the rest of this region of Melos island. The silted harbour inlet (H) once provided for a small fleet, and is still a fishing hamlet site. With both Malthi and ancient Melos, additional prehistoric sites associated with the key soils around the main settlement underline agricultural priorities. In later prehistory the Malthi acropolis may have been the residence of the elite while the farmers lived at the site indicated amidst the flysch (Cf. Fig. 2A).

Essentially Human Factors

The overwhelming preference among prehistoric and ancient farming groups for particular soils (cf. Figs. 4 and 9) is due to their lightness and high fertility, and to the pre-eminence of cereals and olives in the agricultural economy. The lack of an efficient plough and their general nutrient poverty prohibited intensive working of the heavier and stonier soils, particularly the

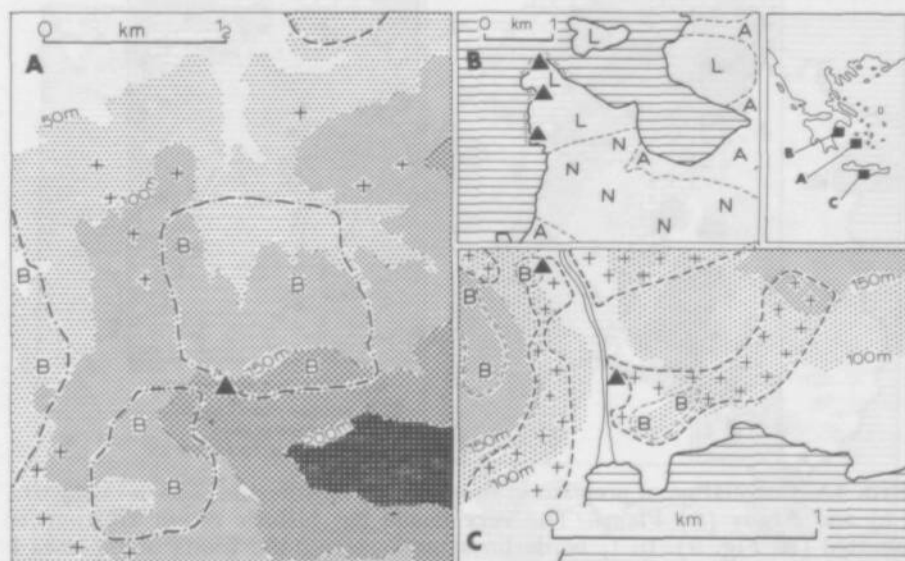


FIG. 3: A. On Melos island, it is common to find sites such as this of Pandeileimon, a small cemetery of Bronze Age date, closely associated with two isolated patches of favourable soil (developed to maturity on shelves and represented by B), amid exposures of tuff bedrock (crosses) and areas of minimal soil development (left blank). A family holding?

B. In the Argolid, three flint sites of Neolithic or Early Bronze Age date stand apart from other early sites in the region (which normally occupy the Neogen marls-N), and are located instead on the coast of a bare limestone peninsula (L). Recent alluvium-A. Their specialist function as shellfish sites is clear from their association with localized shallow reefs (dense stippling) and the significance attached to exactly these inshore zones by present day fishermen.

C. In the Agiofarango Gorge, Crete, two Minoan collective tombs or 'tholoi' are sited adjacent to discrete zones of good soil (B-developed on marls and schist) and connected to rather more extensive zones of poorer but workable soils (crossed and enclosed). Blank areas are insignificant for agriculture. These 'tholoi' seem to mark family field holdings, and it is traditional Greek practice to bury the dead by a chapel alongside an ancestral holding.

very widespread Upper Pleistocene colluvium and alluvium, known as the Older Fill (cf. p. 71 *et seq.*).

The spread of olive and vine cultivation over Greece during the Early Bronze Age, as Colin Renfrew has pointed out, may have stimulated population growth in areas previously sparsely settled due to limited soil productivity.² Surplus production of the novel cultigens could have been exchanged for imports of local

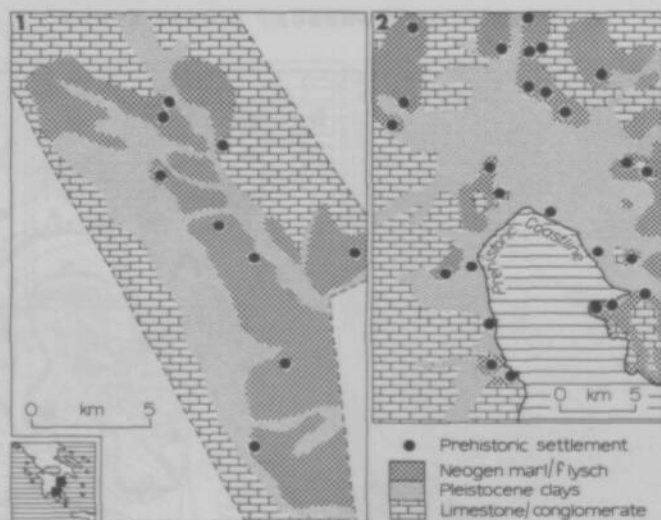


FIG. 4A. Correlation of prehistoric sites and the most fertile soils in the Sparta (1) and Argos (2) Plains. The very fertile but historic recent alluvium is omitted (cf. Fig. 9). In 1, borderlines mark merely the limits of the area I studied.

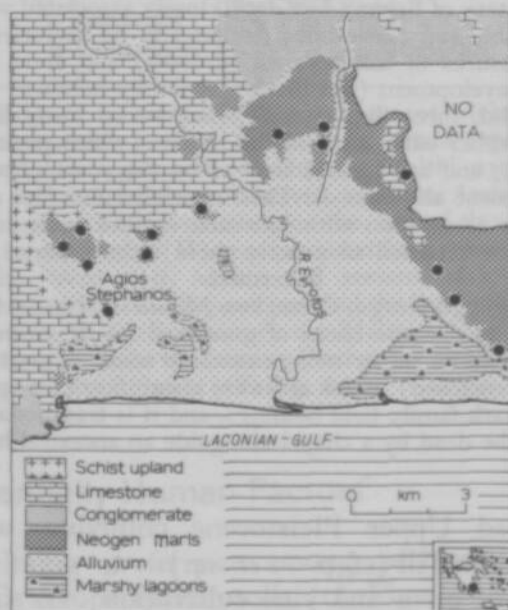


FIG. 4B. Correlation of prehistoric sites (solid circles) and the most fertile soils available in prehistory in the Helos Plain (South Laconia).

The recent alluvium of the plain proper, with its remnant marshy lagoons was largely formed in later, historic times (cf. Fig. 9). Agios Stephanos is the most south-westerly site (cf. Fig. 2B).

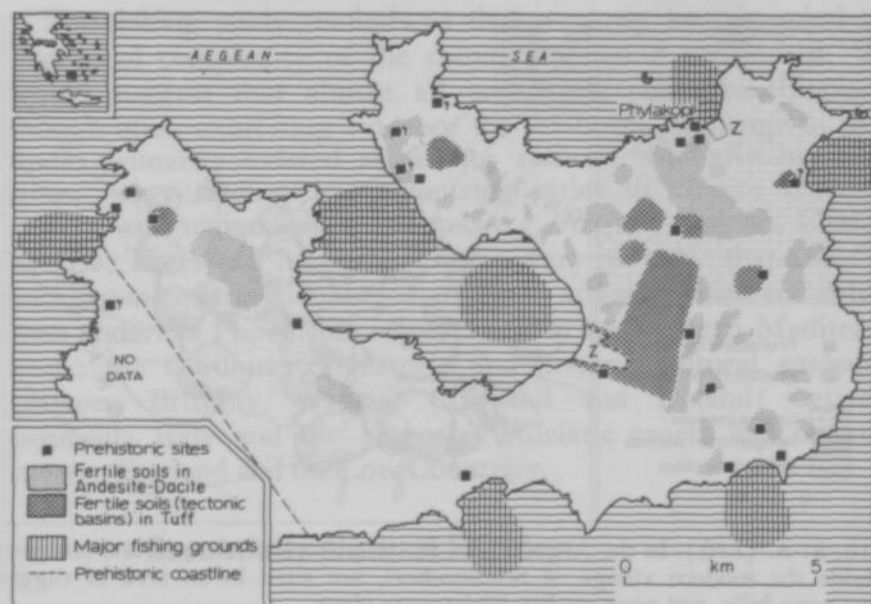


FIG. 4C. The island of Melos demonstrates a remarkable correlation between its prehistoric sites and highly localized arable and fishing resources. The important Bronze Age 'town' of Phylakopi with a nearby Neolithic fishing station, shows a notable combination of both land and sea resources, though its sheltered harbour is now silted up. The areas in the island marked 'Z' may also once have been harbours.

deficiencies in food, and, increasingly, raw materials such as metals. However, there is no evidence for relocation of settlements in entirely novel micro-environments in response to the new crops, and even possible specialist olive or vine settlements remain closely associated with whatever limited areas are locally available for the staple cereal product (Fig. 5).

An island such as Melos or Thera, with little cereal and olive land, but plentiful vine soil, would have benefited enormously from intensified surplus wine production. Significantly, the vine is a crop which, grown on a large-scale, rapidly outsteps local consumption. Strong fishing interests in the Cycladic isles would have encouraged such exchanges of products. A similar combination can be found in the Hebrides, with low cereal production, strong inter-island fishing movements and the surplus production of woollens.

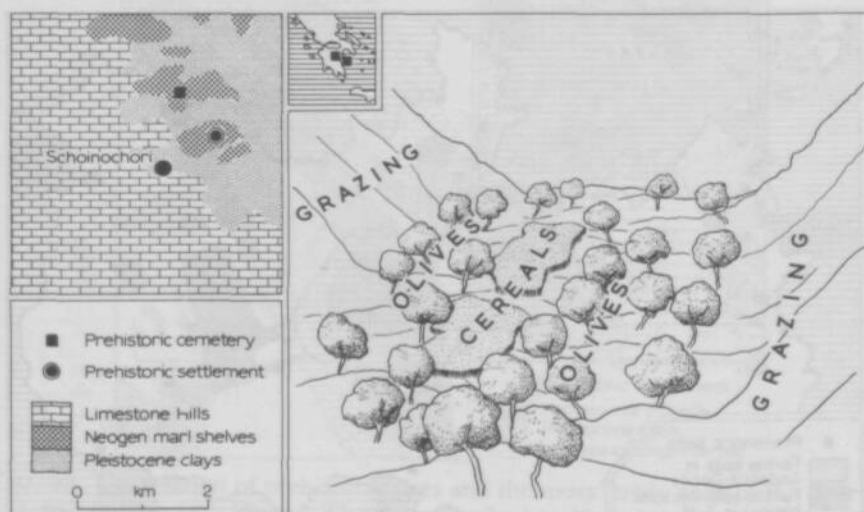


FIG. 5: A. (Left). In the Argos Plain, the prehistoric settlement and cemetery beside the modern village of Schoinochori, are sited in an area of rugged limestone hills, and poor quality Pleistocene clays.

The prehistoric economy is likely to resemble that of the modern village, extensive olive groves and much sheep/goat herding. A limited but highly fertile series of Neogen marl shelves, would, however, as today, provide much of the essential cereal land to enable self-sufficiency to coexist alongside surplus olive and animal production.

B. (Right). Many prehistoric sites discovered by the Argolid Survey appear to represent farmsteads with an extensive associated area of primarily 'olive land' (uneven terrain, heavier clay soils) where cereals might be grown beneath the olives in alternate years. But at the core of the site is a central, if small, area of level land with a very stable and mature soil, ideal for cereal production. Self-sufficiency may once more be combined in such situations with a surplus olive-oil production.

Modern dependence on cash-cropping and regional economic interdependence has led Greek villages to attenuate the locational links that previously ensured a reasonable self-sufficiency and to banish the once crucial cereal and olive soils to the periphery of their exploited territory (Fig. 6).

Seaworthy boats may open up a new resource—the abundant mobile fish shoals, but also a whole new way of life with important consequences for cultural development. Figure 7 illustrates the results of a study of migratory fishermen in the Aegean and its relevance to cultural linkage and the movement of ideas and raw materials between particular regions.

The fishing study reminds us that we must bear in mind the degree of complexity of the community being considered. We would suggest that almost all prehistoric coastal settlements, though often exhibiting evidence for sea-borne exchange in their finds, primarily existed as fishing stations. In early historical times many trading and colonizing cities in Greece correlate closely with major fishing grounds e.g. Aegina, Corinth, Chalcis, Eretria, Thera and Megara. It seems very probable that a similar background of traditional movements in migratory fish and fishermen underlies Phoenician colonization in the western Mediterranean; the continual prehistoric and historic cultural exchange between Brittany, Galicia, Cornwall and Ireland; between peninsula Italy and the Yugoslav Adriatic coast; and between eastern England and the Low Countries.

Essentially Natural Factors

Alluviation Cycles and Climatic Change

A remarkable conclusion drawn from early settlement patterns throughout Greece, up to the Roman period, is the almost complete neglect of the most valuable present day soils, the major expanses of recent alluvial silts. Here are concentrated swarms of modern villages, surrounded by highly profitable irrigated cultures. The dearth of ancient sites on this soil is hard to explain, for those such as W. Loy, who maintain that Bronze Age peoples were as much irrigation farmers as the Greeks today. Others, such as Hope-Simpson and McDonald, hold that these recent alluvial bottomlands were too marshy for early cultivators.

In fact these recent alluvial formations were deposited, in almost their entirety, during and after the Roman period, and up to that time extensive alluvial soils were represented solely by the heavy and generally low fertility Pleistocene formations. Those areas of intensive irrigation cropping today occupy land that was of an entirely different character throughout prehistory—Pleistocene colluvium/alluvium, Pliocene marls, open sea, and to a limited extent—lagoon and delta saltmarshes.

The major breakthrough in this field came with C. Vita-Finzi's studies on the recent geomorphological development of the

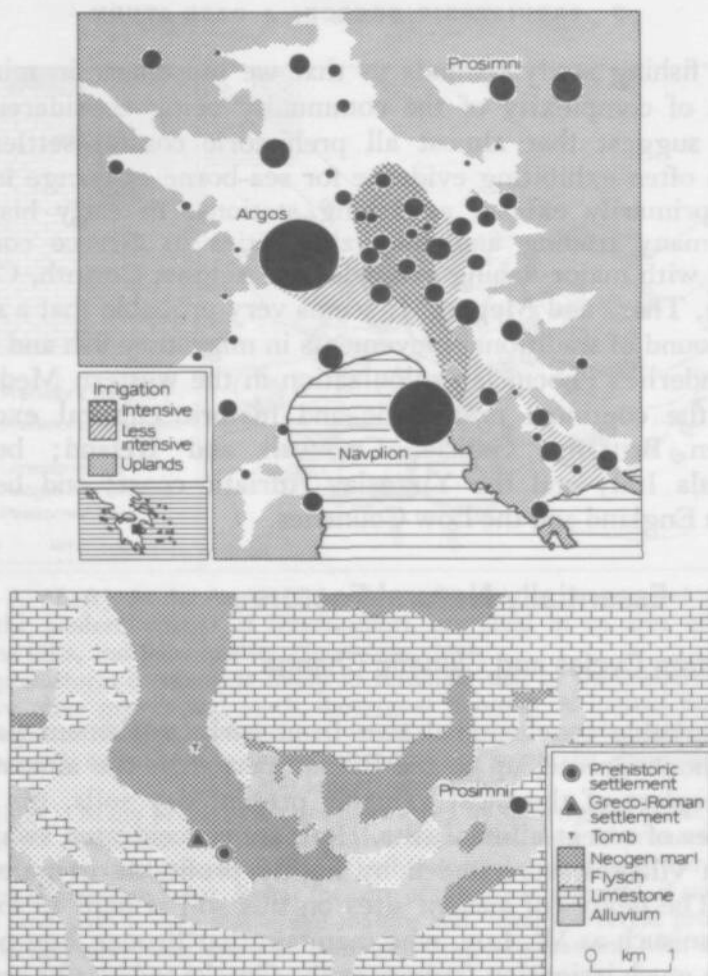


FIG. 6. An historical change in both environment and crop preference can produce dramatic shifts in settlement patterns.

(Upper) Relative size and distribution of settlements in the Argos Plain in 1928 (size indicated by relative diameter of open circles marking each settlement). Compare this with the prehistoric distribution of Fig. 4A. Argos remains important as the regional centre, and Navplion takes over the several prehistoric ports in its functions. The extreme poverty of settlement in the formerly best soil areas is due to a movement onto recently formed alluvium in the south-east plain, and into the lower irrigable areas of the Pleistocene clays, with irrigated citrus crops the priority in a market economy. The cross-hatched zone was the zone of maximum irrigation in 1928; the hatched zone almost as intensive (contemporary data from Lehmann, H. (1937) *Argolis*). The technical ability to create deep wells for irrigation and the citrus fruits themselves are very recent innovations, while the extensive and moist alluvium is mostly an historic formation (cf. Fig. 9).

Mediterranean valleys.³ In Figs. 8 and 9 we illustrate schematic valley changes in the Vita-Finzi scheme, the chronology of depositions and correlation with climatic changes, and the reconstructed development of several regional landscapes in Greece (based on my own fieldwork).

Sea Levels and Regional Tectonics

Another important factor that must be evaluated as a dynamic component in the landscape is sea-level fluctuation. Since many famous Classical sites show marine transgressions, attention has frequently been focussed on this phenomenon.⁴ Recent discussions highlight two different schools of thought.

The more traditional holds that the sea level is rising absolutely throughout the world, i.e. eustatically, and there is a general rise of *c.* 2m since the Classical period. This rise is a continuing process, and began at the end of the last Glacial period, when there is general agreement on a depressed sea level of at least minus 100m on today's level—due to the water stored in greatly enlarged ice-sheets.

The second school, whose main Mediterranean protagonist is N. C. Flemming,⁵ believes that the eustatic rise ceased about 4,000 years ago, and that any major alteration in the relationship of land and sea since that time, is due to local events, such as isostatic rebound in formerly glaciated areas, or long-term tectonic warping of the crust in areas recently active orogenically.

Though Flemming has presented complex mathematical models and calculations in support of his theory, it is difficult to accept that a process of uplift and downwarp over an area as large as Greece and Asia Minor would produce a practically identical relative sea-level rise for numerous ancient sites of *c.* 1m per millennium.

(Lower) Facing page, The village of Prosimni is indicated in Fig. 6A within the general Argos region. T denotes a princely tomb belonging to the ruler of prehistoric settlement—Bərbati. It is apparent that prehistoric and ancient communities were, as elsewhere, predominantly interested in the former group of soft and lime-rich soils ideal for cereals and olives. The modern village bases its economy on producing tobacco for export, a crop unusual in its preference for heavy and stony clays (marked here as 'alluvium').

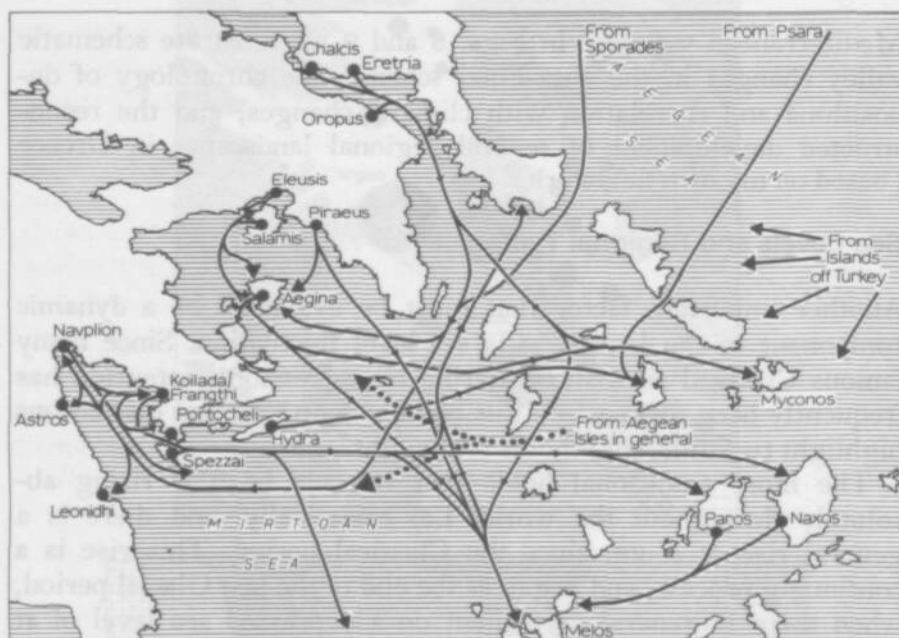


FIG. 7. Seasonal movements of fishermen in the west-central Aegean. Only a limited survey was undertaken, and many more routes remain to be plotted.

These migrations of fishermen, especially in pursuit of the migratory tunny and sardines, can be shown to be highly significant in the explanation of the persistent cultural links within the area of maximum traffic, from the first appearance of tunny, Melian obsidian and alien sheep at Frangthi in the Mesolithic, later with the directional spread of obsidian in the Neolithic and Early Bronze Age and common cultural features throughout the Neolithic and Bronze Age shared within this region. The first sites on the islands can be shown to be settlements of seasonal fishermen (e.g. Saliagos near Paros, Agrilia on Melos, Mavrispilia on Mykonos).

An objective examination of his data actually gives far more support to the traditional theory than to his own interpretation. Nor do recent measurements of the trend of crustal movements in Greece provide any evidence of such forces at work.

Before the Classical period, very little is known about the rate at which the ocean rose, and most authors have used a simple extrapolation, into later prehistory, of the rate recorded by submerged historical monuments. Some support for this comes from a recent C14 dated pollen core extracted from Lake Giannitsa in the plain of western Macedonia, and a C14 dated sedimentary core obtained from the Helos Plain in Laconia. Local sea-level heights were

obtained for various prehistoric periods, then a comparison was successfully made with a generalized plot of worldwide sea-level rise for the entire Holocene. Between Neolithic and historic times, *c.* 5000 to 500 B.C., the sea rose, on average, by about 1 metre a millenium.

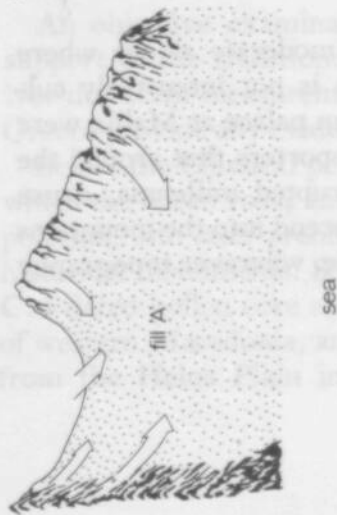
Given the probable height of the sea in prehistory, and the absence at that time of nearly all the recent alluvium, the distance from the shore can be posited for several early settlements, now landlocked amid rich irrigated silts, but then almost certainly fishing and trading stations backed by poor soils (e.g. Tiryns, Agios Stephanos). In many areas of Greece earthquakes and igneous activity have been recorded in very recent times, but the rates of subsidence and faulting appear to be so gradual as not to distort the Aegean eustatic figures from their reasonable fit with other regions, excepting very active parts of Greece, e.g. Melos, Thera, West Crete.

Erosion and Deforestation

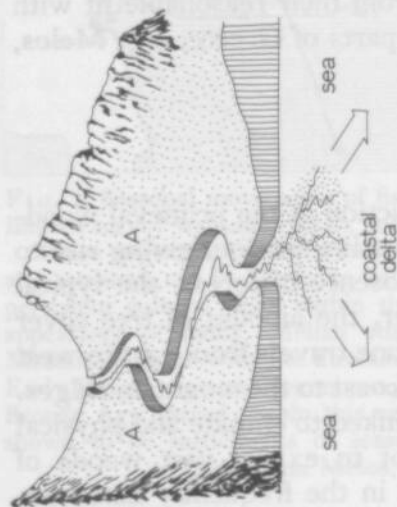
It is constantly stated, that the destruction of the primeval woodlands, by human activity, produced massive erosion, giving rise to the bare slopes and thin soils, the absence of forest, the typical Greek countryside of today. However, the amount of tree cover and the maturity of soils increases as one travels from east to west and from south to north, and from the coast to the mountain ridges. In Fig. 10 we can see this as closely linked to climate and physical geography. Furthermore, we are not to expect vast woods of lofty trees, nor well-developed soils, in the frequently harsh environment of Greece.

Secondly, a woodland is restricted to moderate slopes where soil residues accumulate, and where man is not intensively cultivating. Geographers studying the Minoan palace at Mallia were quick to point out to the deforestation supporters that around the site there have been, for almost uninterrupted millennia, dense arable fields, but for those who bother to ascend into the mountains backing on to the coastal plain they may see, wherever topography permits, fine woodland.

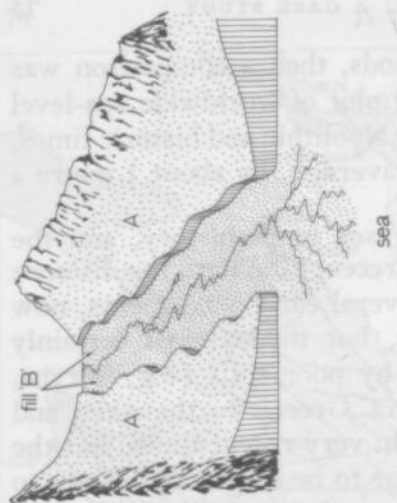
Stage I



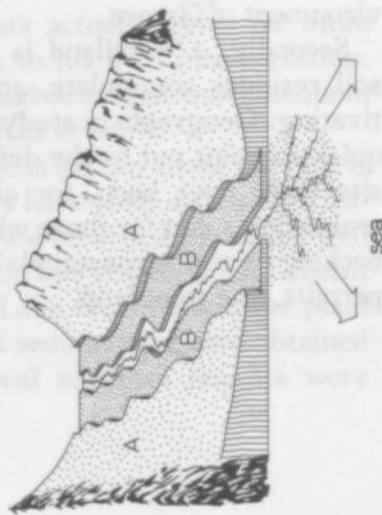
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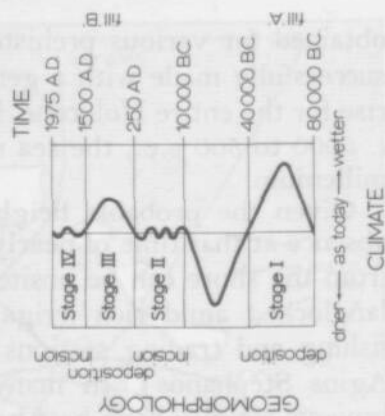
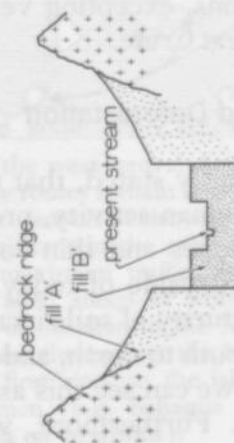
Stage III



Stage IV



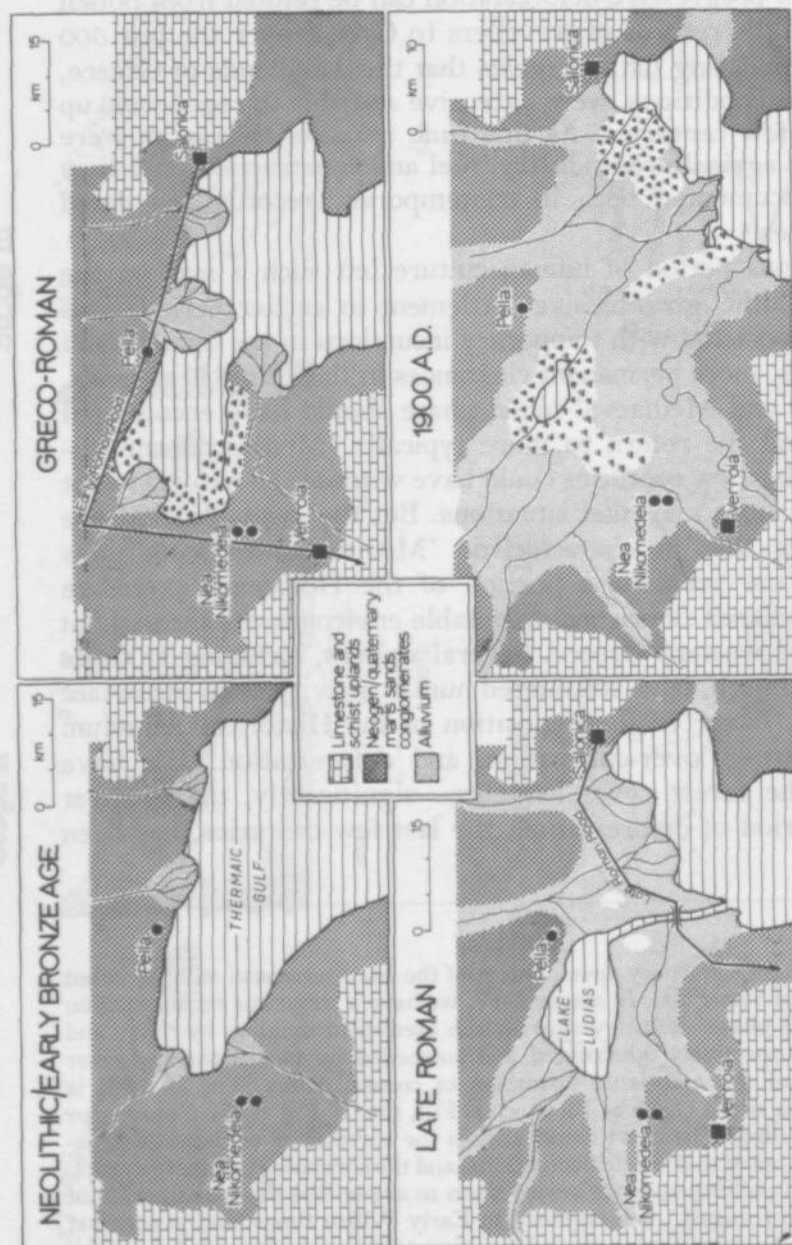
X-section at Stage IV



Thirdly, a progressive deforestation can be refuted from pollen studies, and the records of travellers to Greece over the last 500 years. Accumulating data suggests that the woodlands of Greece, in favourable conditions, were extensive and able to regenerate up to the last few centuries. At this time massive clearances were effected, for agriculture, industry, fuel and construction, and they are well documented both in contemporary records and dated pollen profiles.⁶

No previous period of human culture left such a scar on the woodlands, although intensive settlement in earlier periods was doubtless associated with temporary incursions in the uplands and rockier areas, more permanent clearances in the arable heartlands. The Roman and Mediaeval moist phase should have encouraged woodland and the return to more typically 'Mediterranean' climate in the last few centuries could have witnessed a natural forest recession in more marginal situations. But the available evidence demonstrates that in characteristic 'Mediterranean' conditions throughout the prehistoric portion of the Holocene, extensive natural woodlands flourished in suitable environments throughout northern and western Greece. Several writers, including at times Vita-Finzi himself, have considered human activity as an important contributory factor to the deposition of the Historical Alluvium by over-grazing, over-cultivation, and deforestation. We have examined the forest cover evidence—significantly, the greatest recorded period of deforestation, the last few centuries, has been

FIG. 8. The Late Quaternary development of the Mediterranean valleys, based on the studies of Vita-Finzi. In stages I–IV, we have a schematic reconstruction of the two main phases of valley aggradation (sediment build up by rivers and slope-wash), respectively interrupted and succeeded by two periods of river downcutting and the associated formation of coastal deltas. The 'A' Fill is often referred to as the Older or Pleistocene Fill, the 'B' Fill as the Younger or Historical Alluvium. The chart demonstrates the correlation of these geomorphological features with climatic fluctuations, and the chronology of these events. The evidence of pollen sequences would seem to argue that the moist period of the last Ice Age (Stage I) was confined to Early Würm times, and in contrast to Vita-Finzi, who continued stage I deposition to the end of that Ice Age, the present writer has indicated here a dichotomy of climate and geomorphic process between Early Würm (till c. 40,000 B.C.) and Late Würm (till c. 10,000 B.C.).



FIGS 9A-D. The recent landscape changes in certain regions of Greece and their significance for the interpretation of associated prehistoric sites.

FIG. 9A. The recent development of the West Macedonian Plain. Prehistoric sites solid circles, ancient cities solid squares. Clearly the changes in soils and accessibility to the sea are very substantial.

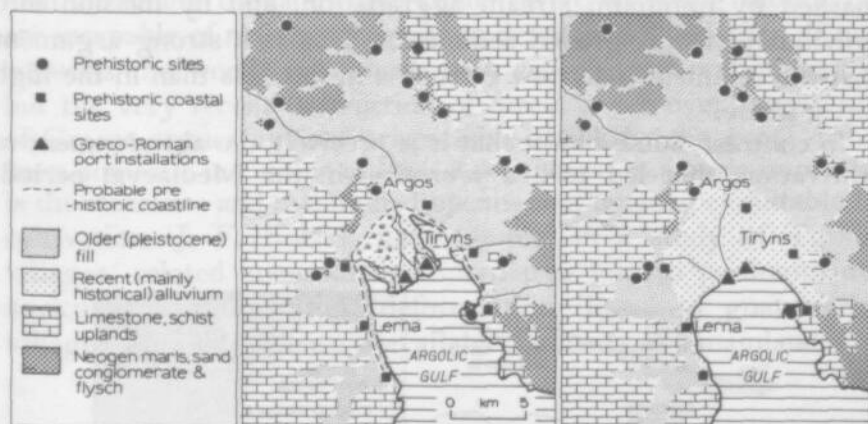


FIG. 9B. The recent development of the Plain of Argos. The left map shows the prehistoric landscapes also the situation by the Greco-Roman period (the additional outgrowth of deltas of recent alluvium); the right gives the present-day landscape. Both soils and accessibility to the sea have altered significantly in this region.

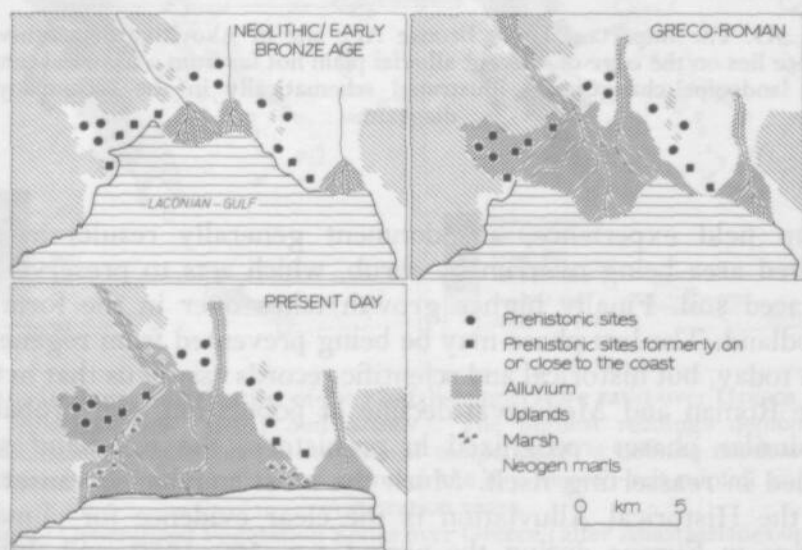


FIG. 9C. The recent development of the Helos Plain. The site of Agios Stephanos is the most southwesterly indicated. Soils and accessibility to the sea have changed dramatically here over the periods illustrated.

marked by minimum stream aggradation, and by incision into previously steeply-graded sediments. This is a strong argument that the sediment load now carried is in fact less than in the high forest phase.

In contrast, some object that it is precisely the abandonment of cultivation, that led to heavy erosion in the Mediaeval period.

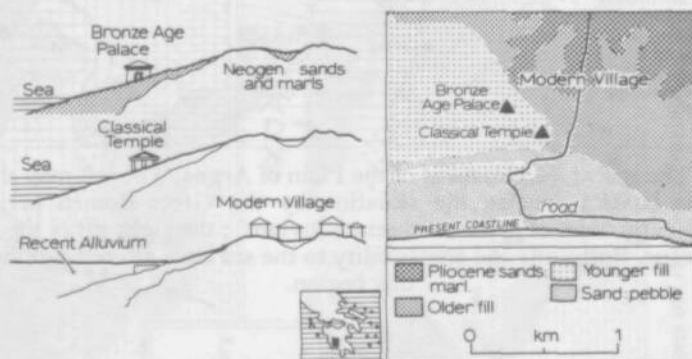


FIG. 9D. The important Early Bronze Age site of Akovitika in south-west Greece lies on the edge of a recent alluvial plain not far from a Classical temple. The landscape changes are illustrated schematically in the accompanying diagram.

From field experience, abandonment generally results in the cleared area being overrun by shrub, which acts to preserve the terraced soil. Finally higher growth takes over in the form of woodland. The last phase may be being prevented from regeneration today, but historical and scientific records assure us that in the Late Roman and Mediaeval decline of population, and probably in similar phases recognized in prehistory, the woodland succeeded in reasserting itself. Much the most convincing causation for the Historical Alluviation is the clear evidence for climatic change in Europe during the period A.D. 500–1850, and this is admirably presented in the work of the historical climatologist H. H. Lamb,⁷ quite independently of the geomorphological evidence presented by Vita-Finzi.

Finally, some have argued that the goat is a major agent for

man in ruining the landscape. Goats thrive on young shoots, but are incapable of making progress in developed woodlands. If man converts the woods into shrub they can prevent reafforestation, but the very recent destruction of forest cover over large areas of Greece argues against progressive attack by the goat—it has been domestic in Greece at least 8,000 years! Far more important is the clearance and maintained openness of landscapes suitable for cultivation. J. F. Kolars, for example, in a study of Turkish villages, related zones of maximum tree loss to predominantly agricultural communities, deforestation 'lows' to goat-rearing villages. Similar evidence is available for the Greek mainland.

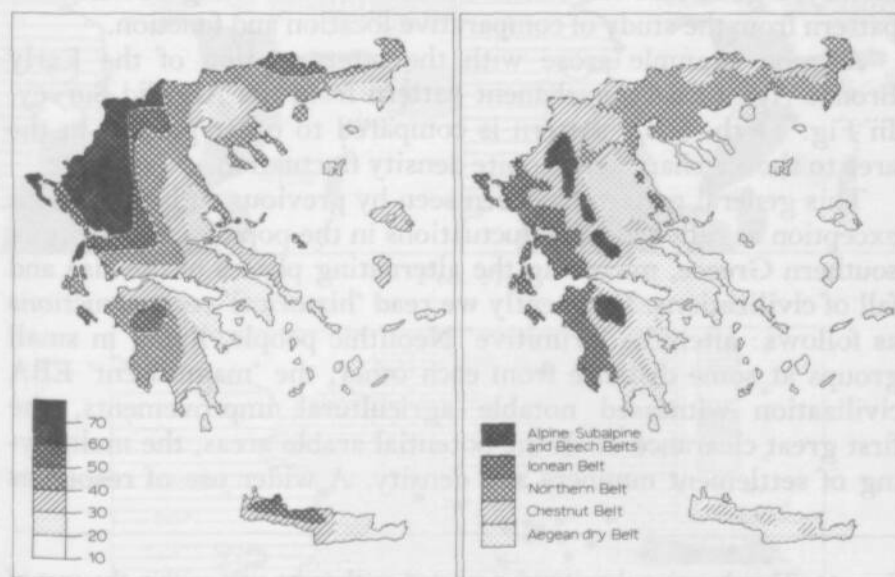


FIG. 10. Left: Distribution of the rainfall-temperature ratio over Greece (after P. Anastassiades (1949) *Soil Science*). The highest readings demonstrate maximum precipitation and minima of temperature; a definite north-west to south-east cline is clear; as we approach the dry Aegean belt rainfall sinks and evaporation soars.

Right: Generalized Vegetation Zones over Greece (after Anastassiades op. cit.) A similar north-west to south-east cline, upland to lowland cline, is clear; we begin with Alpine flora, passing through continental deciduous growth to typical Mediterranean arid brush. The interaction of depression tracks, mountain features and latitude could be seen as at least, if not more significant than human activity in determining the degree of soil maturity and forestation in e.g. the region of south-east Greece and the Aegean islands.

Social and Political Units of Settlement

We have seen the site-by-site analysis separate out individual priorities as regards arable resources, grazing areas, marine potential. Information about the interaction between the numerous loci of settlement and activity over the landscape, is obtained from a comparative study of the factors of location, the differences observable in extent and probable function of each site, and the possibility of contemporaneity.

Despite the wide bands of time to which we have to assign the possible period of occupation at sites in the earlier phases of pre-history, a good case can often be made for abstracting a settlement pattern from the study of comparative location and function.

A good example arose with the interpretation of the Early Bronze Age (EBA) settlement pattern from the Argolid Survey. In Fig. 11 the EBA pattern is compared to other periods in the area to show a characteristic site density fluctuation.

This general pattern has been seen by previous authors without exception as reflecting the fluctuations in the population density in southern Greece, mirroring the alternating phases of the rise and fall of civilizations. Frequently we read 'historical' reconstructions as follows: after the 'primitive' Neolithic people, living in small groups at some distance from each other, the 'magnificent' EBA civilization witnessed notable agricultural improvements, the first great clearance of all the potential arable areas, the multiplying of settlement numbers and density. A wider use of resources

FIG. 11. The changing density of suspected settlement sites within the area of the Argolid Survey is typical for most of southern Greece. To the west can be seen the Argolid Gulf (cf. Fig. 12 for more detail).

FIG. 12. Correlation of prehistoric settlement traces and soil groups in the area of the Argolid Survey. Positive occupation indicated by solid circles, possible by solid circles with question-marks (cf. Fig. 11 for period breakdown). Soil groups: 1. thin and low fertility soils developed on crystalline limestone and conglomerate; 2. moderately deep but high fertility soils developed on serpentine; 3. moderately deep and high fertility soils developed on Neogen marls and sands; 4. recent alluvium and colluvium: a heavy and low fertility clay of Pleistocene date, and a rich alluvial silt known to have been deposited in all essentials in the Late Roman and Early Mediaeval periods. The broken line denotes the probable coastline till historic times.

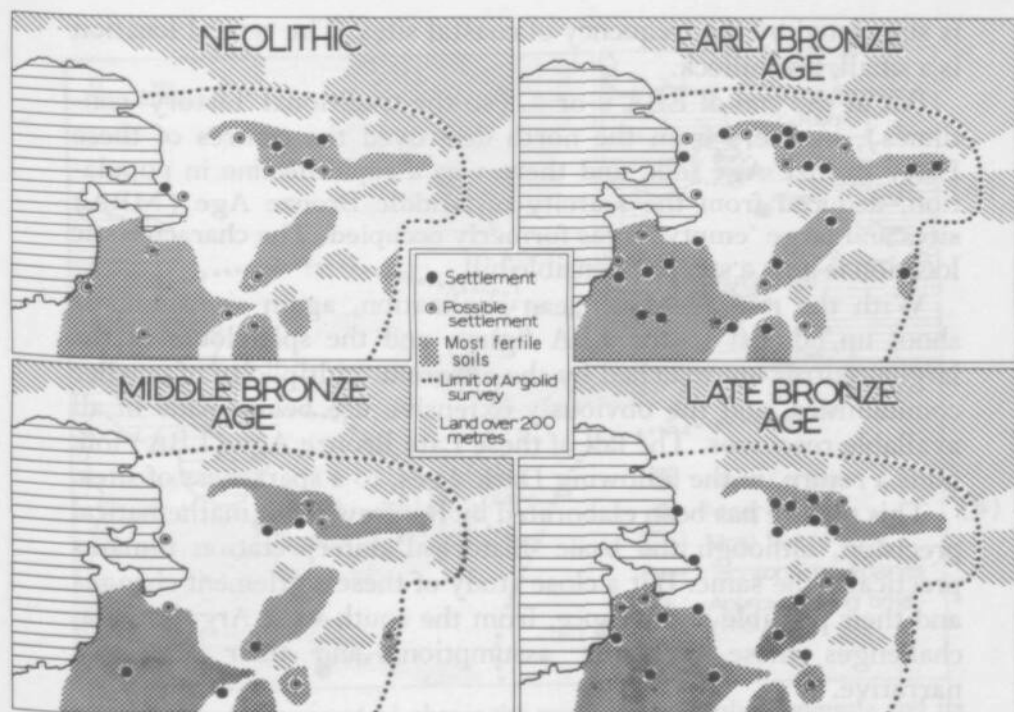


FIG. 11.

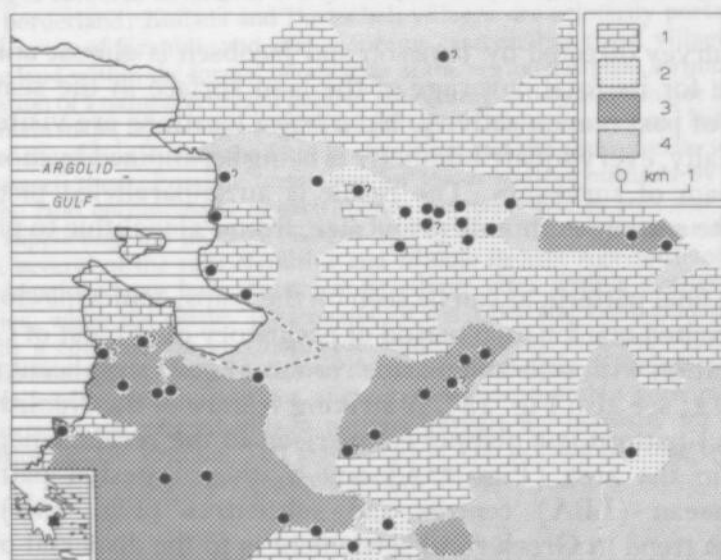


FIG. 12.

is suggested by the frequency of coastal sites. The typical location is a small, low hillock.

But at the end of EBA 2 or 3, (so the traditional 'history' continues), invaders from the north destroyed the centres of these Early Bronze Age folk, and there was a rapid decline in population, deduced from the scarcity of Middle Bronze Age (MBA) sites and large 'empty' areas formerly occupied. The characteristic location is now a steep, defensible hill.

With the rise of Mycenaean civilization, again site numbers shoot up, almost to the EBA figure, and the splendours of the larger centres are matched by the apparent multiplicity of smaller communities, and the obviously extensive use being made of all available resources. The fall of these Late Bronze Age (LBA) folk finds a return, in the following Dark Ages, to a sparseness of sites.

This picture has been elaborated by Renfrew, with mathematical precision, although the basic 'historical' interpretation remains practically the same. But a close study of these settlement changes and their possible significance, from the south-west Argolid data, challenges these orthodox assumptions and their attractive narrative.

Prehistoric Settlement Density and The Argolid Survey

This survey directed by Jameson and Jacobsen is almost unique in Greece for its total coverage of the land surface in the search for traces of past human activity. No *a priori* locations are visited preferentially, every square kilometre is being scrutinized by more than one team of surveyors. The result is an unparalleled picture of absolute settlement numbers and size, from Palaeolithic to present-day.

The final pattern, as can be seen on the maps, conforms closely to the accepted one for each period of prehistory over most of Greece. Correlation with soils and marine resources gave significant results (Fig. 12; see also Fig. 13). A striking feature of the Neolithic and (MBA) pattern is a distinct comparison to the recent village network in the area (Fig. 13A) and to the suggested pattern of Mycenaean (LBA) centres and subcentres (Fig. 13B). The modern trend in Greek rural settlement is to the dispersal of these traditional large nucleated villages into scattered individual farm

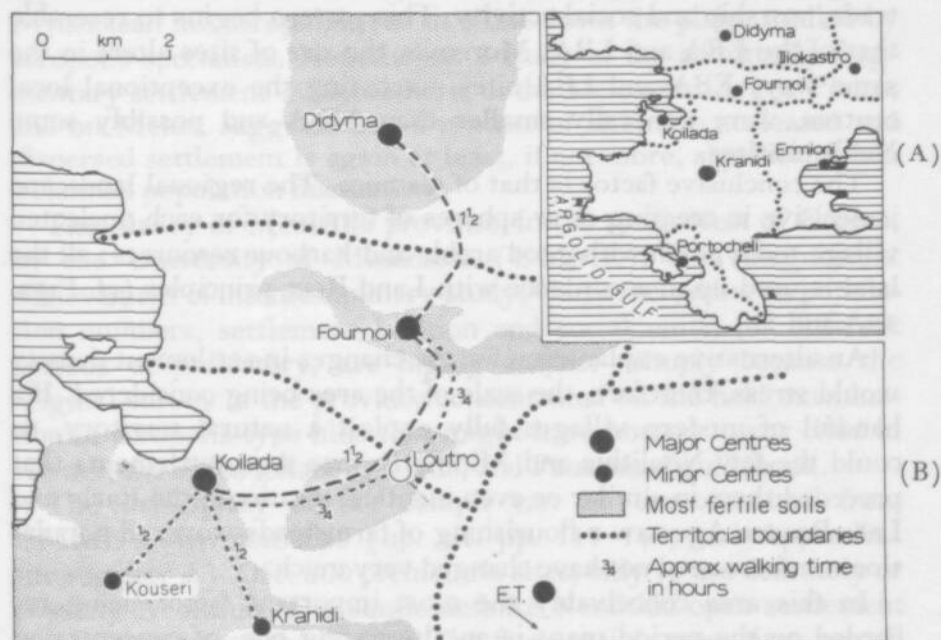


FIG. 13. The inset map (A) shows the south-west Argolid Peninsula and its modern settlement territories. The territories of Didyma, Fournoi and Iliokastro villages conform to natural valleys and basins with good soils, surrounded by arid borderland; Koilada and Portocheli villages are primarily ports for the regional town of Kranidi, and major fishing centres, but these villagers also cultivate land within the formal boundaries of the regional capital. Ermioni has a combination of a natural enclosed plain of moderate fertility and a major harbour.

The main map (B) shows a suggested pattern of major centres and subcentres in part of the region during the Late Bronze Age, and the approximate walking-time between them. Possible territories for major centres outlined by lines of dots. The land encompassed in each sphere is comparable in area and location to that supporting the modern villages in Fig. 13A. It can be argued that in Fig. 11, several of the rare Neolithic and Middle Bronze Age settlement sites in key locations may have been hamlet/village sites with a similar size of territories, while the dense 'settlements' of the EBA and LBA very probably represent a combination of villages or 'empty centres' and surrounding dispersed farmsteads. A consideration of the density and scale of findspots in these latter periods, even allowing for shifts in settlement within each period, in comparison to the present village pattern, reveals the necessity for such an explanation. E.T.: Ermioni Tell major centre. The Koilada site may have been the regional centre 'Mases'.

units throughout their territory. The village remains as a centre of trade, worship and social activity. This pattern begins to resemble that of the EBA and LBA. Moreover the *size* of sites alters in the same way: EBA and LBA sites, excluding the exceptional local centres, were generally smaller than MBA and possibly some Neolithic sites.

The conclusive factor is that of distance. The regional landscape is decisive in creating clear spheres of territory for each nucleated village today, each with good arable and harbour resources; all the land is used up in accordance with Land Rent principles (*cf.* Figs. 13A and 12).

An alternative explanation for the changes in settlement density would stress, therefore, the scale of the area being considered. If a handful of modern villages fully exploit a natural territory, so could the few Neolithic and Middle Bronze Age settlements that preceded them in similar or even identical locations; the Early and Late Bronze Age saw a flourishing of farmsteads—overall population numbers need not have changed very much.

In this area conceivably the most important factor being recorded on the period maps is an alternating one, of concentrated and dispersed settlement. The crop changes discussed by Professor Renfrew, could certainly have led to a higher overall population in the EBA, and a greater return from the landscape may have encouraged the dispersed trend of this epoch. Possibly also insecurity in the MBA led to nucleation, relaxed in the 'Pax Mycenaea' that followed. But it does seem likely that the MBA folk exploited the same zones of the landscape as their predecessors. As Lehmann once commented, the location of settlement does change over time, but not the area of settlement.

In the Agiofarango Valley in Crete, a similar result was obtained (*cf.* p. 93) on units of settlement, but other areas of Greece lack the survey cover of the south-west Argolid, and it is not unfair to say that beyond these two surveys, attention has understandably concentrated on—or even been confined to—locating large sites of an obviously dominating nature e.g. the 'fortress towns' of the LBA. Communities smaller than this, unless in strategic positions, receive scant attention, though they certainly existed, and are usually found by accident!

Thus in the Sparta Plain one recorded Neolithic site exists, a

typical low mound, found by a Neolithic specialist, while great Mycenaean hill acropoleis run in a line down the plain, studied by acropolis specialists. Nonetheless a study of the admittedly fragmentary settlement evidence here, in the Helos and Argos Plains, and on Melos, suggests that a process of alternate nucleated and dispersed settlement is again at least, if not more, significant than a claimed population fluctuation.

The survey of Messenia province, in the south-west of Greece, by the University of Minnesota (UMME), is a magnificent achievement of interdisciplinary study;⁸ but conclusions on population numbers, settlement location and social units, for different periods of prehistory, are highly suspect—simply because the original survey of the province concentrated on the field examination of acropolis-type hills that might have housed towns cited in Homer, the Pylos Palace accounts, and Pausanias' guidebook.

The inadequacy of the sample can be demonstrated from UMME's own statistics (*op. cit.* pp. 117–147, and Appendix: site register A). Of *c.* 300 prehistoric sites, only 18 are definitely or possibly Neolithic. The single definite Neolithic open settlement was known before the survey. The five possible open sites, are all high hills. Remaining sites are caves (8) or caches of finds. Only one site could be earlier than Late Neolithic. UMME discovered only one-third of the 35 certain and possible EBA sites. But two-thirds of the certain examples were low natural or artificial knolls. With the Middle Bronze Age UMME is more successful: they found two-thirds of 107 definite and possible sites. But 82 of the MBA sites were new foundations, and *c.* 77 per cent of the certain sites are now high to medium hills. Of ten cases where the same location was definitely occupied in both EBA and MBA, seven are high sites. In the LBA of *c.* 195 certain and possible sites, UMME discovered about two-thirds, but about two-thirds of the LBA sites are medium to high locations. Only one definite MBA site was not certainly or possibly reoccupied in the LBA.

In Renfrew's discussion of prehistoric demography, both Messenia and Crete are given steadily increasing population through prehistory while the rest of southern Greece undergoes the familiar cyclical recessions. It seems unwise to use the UMME figures as a real indication of absolute population fluctuations. In fact, in Crete also, the Neolithic and Early Bronze Age periods are very

poorly represented in our sample of known sites. An absurdly low number of Neolithic open sites are recorded, hardly any before late Neolithic, while the Early Bronze Age may be characterized by dispersed farmsteads around communal centres—as suggested for the contemporary Mainland (*cf.* below p. 95).

Network Theory

The analysis of a settlement pattern using network theory is increasingly being adapted from geography by archaeologists, to isolate economic and political units over the landscape. Such studies require a sufficient control over the problem of contemporaneity to allow of a balanced settlement picture, and the kind of intensive surveying that is generally lacking in the Mediterranean. Under such circumstances attempts to identify settlement hierarchies, except for the largest units of community, will fall down on inadequate evidence.

However, even within the limits of surveys, such as those of UMME and R. Hope-Simpson, primarily concerned to locate major Mycenaean centres, we can detect significant patterns that provide information on the natural balance of higher and lower order communities, and on the scale of authority and economic organization.

If one considers Hope-Simpson's maps for the settlement picture of any particular region during the Mycenaean age,⁹ where we have a very accurate breakdown of pottery groups into 50 or 100 year brackets, a definite regularity in spacing of an approximate kind is visible between those sites held to be key centres. It is generally understood that such a regional power node is characterized by very extensive occupation remains and buildings of a palatial nature. With unexcavated and eroded sites, it is the extent of settlement, and perhaps ancient references, that point to such centres.

Examine, for example, the LBA settlements in the eastern Argos Plain (Fig. 14A). With actual walking distances, regular spacings can be established between the major centres, and a site of uncertain status from excavation—the Heraion, is clearly major.

Another pattern over the landscape fully confirms the settlement analysis, that of the Mycenaean Tholos Tombs. These monumental burial structures were built throughout the LBA. Tholoi are rare and are generally taken outside of Messenia to denote princely

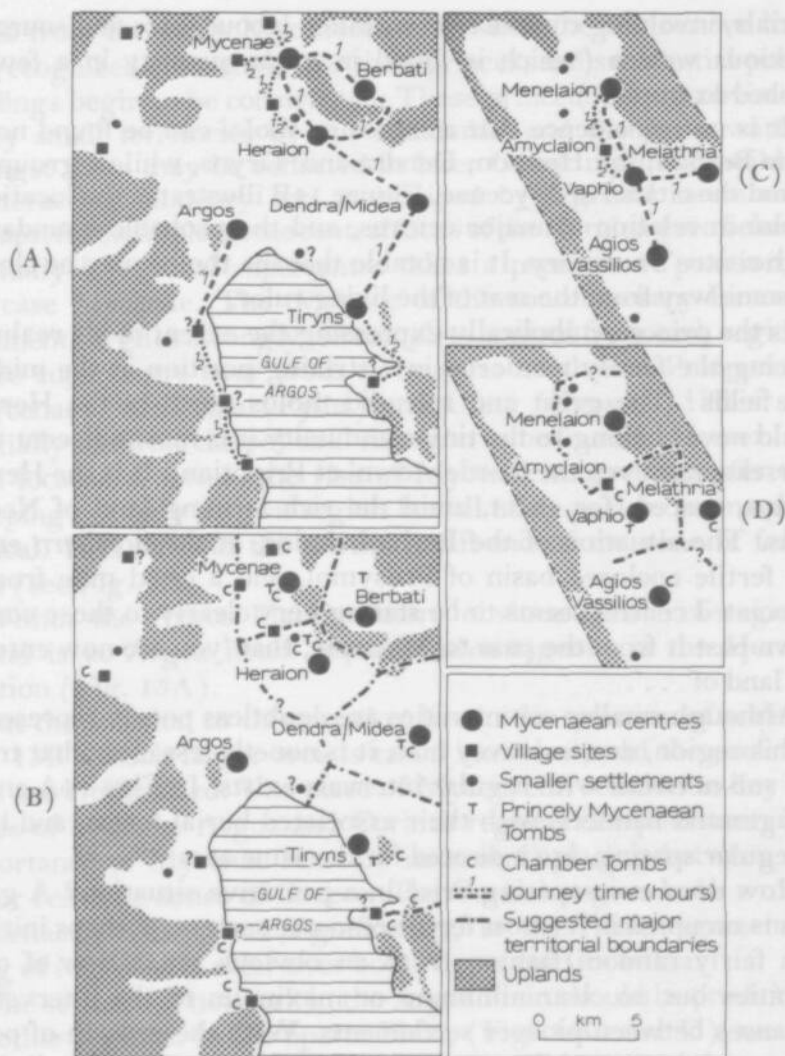


FIG. 14. (A) Regular spacing of Mycenaean centres in the Argos Plain with intervening walking times. The probable line of the prehistoric coastline is here indicated. (B) The location of princely Mycenaean tombs or 'tholoi' within the suspected territory of the major Mycenaean centres. Also of chamber tombs of the 'middle-class' Mycenaean; their presence accompanies major centres and (without princely tholoi) the next level down in the settlement hierarchy from the major 'palace' centre—the village. Smaller units of settlement are significantly provided with very few, or sometimes no notable tombs. (C and D) As was seen in Fig. 4 the prehistoric sites in the Sparta Plain relate closely to the distribution of Neogen sands and marls. In these two maps only the Mycenaean sites are shown.

burials, involving control over a skilled labour force and sources of precious wealth (which is found in great quantity in a few unrobbed examples.)

It is no coincidence that a tholos or tholoi can be found not far from Berbati, the Heraion, Dendra and Tiryns, while a group surround the citadel of Mycenae. Figure 14B illustrates the location of tholoi in relation to major centres, and the probable boundary of each centre's territory. It is notable that the tholos may be close to or some way from the seat of the living ruler.

Is the prince symbolically expressing the extent of his realm, by placing the family memorial in a striking position in the midst of the fields? The great and splendid tholos north of the Heraion, could never belong to the tiny community it is most adjacent to, at Verseka, nor even the 'border town' at Priphtiani. It is the Heraion tholos, spaced, for effect, amid the rich farming land of Neogen soils. The situation of the Berbati tholos, at the northern end of the fertile enclosed basin of Prosymni, and a good mile from its associated centre, seems to be stating very clearly to those coming down past it from the pass to Mycenae, that 'you are now entering the land of ...'.

Although smaller communities are doubtless poorly represented in this region, due to survey bias, it is nonetheless clear that traces of a sub-network with regular intervals exists. In Figs 14A and B, villages and hamlets, with their associated burial forms, and hints of regular spacing, are indicated for the same area.

How does even-spacing arise in a primitive situation? A given area is occupied in its most fertile resource sectors, perhaps initially in a fairly random fashion, with an obvious separation of communities but no clear minimum or maximum to the intervening distances between pioneer settlements. With the growth of population and the rise of élite service functionaries (political, religious, technological), several settlement units may crystallize around certain core centres. Competition between these nuclei for land and satellite populations, may result in a 'sorting out' process—regular spacing emerges and territories are adjusted mutually. There are many long-lived prehistoric settlements beginning in the Neolithic period in the Argos region, but only certain of these rise to local eminence.

The first clear evidence in this area for a settlement hierarchy

comes from the early Mycenaean era, when the centres we have just recognized erect tholoi for their princes, and substantial public buildings begin to be constructed. These princedoms are obviously pretty small territories by our standards, and the petty warfare amongst them may be reflected in later Greek myths. Possibly a counteracting tendency was maintained by regional sanctuaries, perhaps, for example, at the central focus of the Heraion (see below).

Finally a regional supercentre takes a preeminent position, in this case Mycenae. The evidence of the contemporary Linear B documents argues strongly for complete control from each regional palace supercentre over areas as large as north-east Peloponnese (Mycenae), Messenia (Pylos) and Crete (Knossos). This substantially confirms the political situation to be found in Homer.

In locational terms, the rise of Mycenae to greatness far outstripping not only its own region but all other palaces seems paradoxical. It is sited at the northern tail-end of the zone of fertile soils (see Fig. 4A).

Within the Argos Plain, a more obvious choice of regional capital is at Argos itself. Equally advantageous is the Heraion location (Fig. 15A).

But the solution to this paradox lies in the question of scale. In Fig. 15B a much larger area is taken into view, and the preferred soils are emphasized. The place of Mycenae in relation to key soil zones of both the Argos and Corinth regions is equidistant. The importance of Mycenae rests on its central placing between two major resource zones of Greece. The Corinth region lacks a major Mycenaean centre, and significantly, in the *Iliad*, Agamemnon King of Mycenae is ruler over both Argos and Corinthia.

The settlement network in the Argos Plain should be predictable for other regions. In the Sparta Plain, (Figs 14C and D), we find the same restriction to key soils, the same distances between sites of first and second order. Again it seems likely that the rival 'baronies' became united under a 'supercentre' in the mature Mycenaean age, at the Menelaion. Figure 16 demonstrates the latter's place in the overall region.

In the Argolid Survey area, and in the Soulima Valley in Messenia, we can detect definite regularities in spacing between Mycenaean communities of first or second rank, conforming to the general average (Figs 13 and 17).

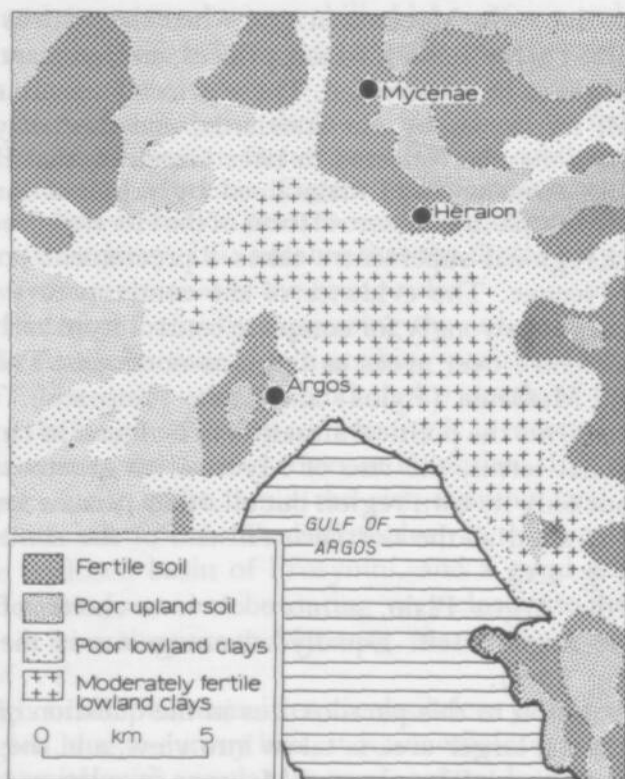


FIG. 15A. The Argos Plain. Coastline as suggested for prehistoric times. The recent alluvium added a new key soil area in later times in the area south of Argos here shown as open sea. A natural centre for this region in prehistoric times, taking account of communications, available soils, the contemporary coastline, might have been expected at Argos or perhaps the Heraion. There is slight evidence for a central ritual function for the latter in the Bronze Age, and such a status is well-attested in ancient historic times. Argos was the regional centre through most of the historic period and is so today, combining its central location in an expanded plain (cf. Fig. 9) with accessibility to both the old priority soil areas and the new irrigated culture zone. With both the prehistoric landscape and inferred soil preferences, and the present-day situation, the pre-eminence in the LBA of the site of Mycenae seems inexplicable in terms of regional geography at this scale.

Ceremonial Sites and the Landscape

In the previous section the value of spatial aspects of burials was demonstrated from the Mycenaean mainland, while the size of a

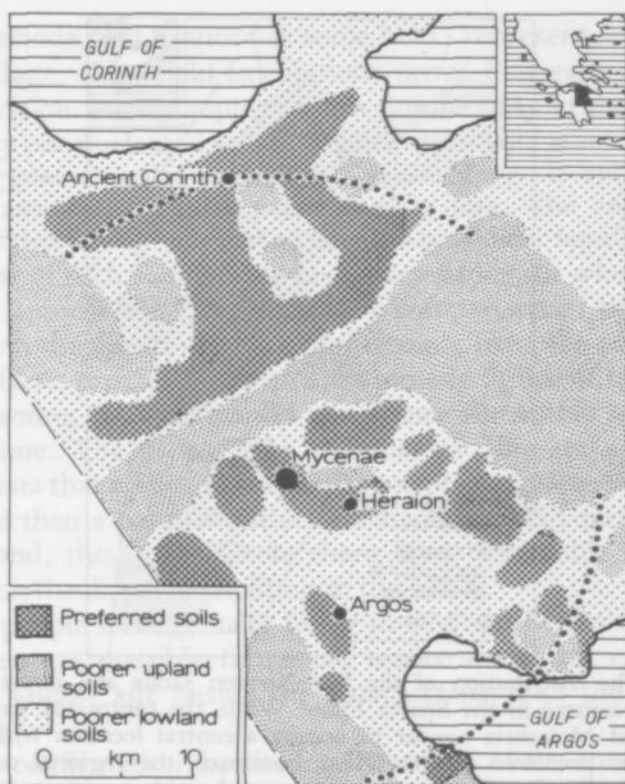


FIG. 15B. The Argos Plain and the region of Corinth to its north. The modern coastlines are indicated; that on the south borders the Argos Gulf, while to north-west and north-east, respectively, may be seen the Gulf of Corinth and the Saronic Gulf. The significance of the Mycenae location as the major prehistoric centre for the Argos region in the LBA can be explained in terms of its approximate equidistance from the southern edge of the fertile Argos Plain region and the northern fringes of the fertile Corinth Plain and Plateau region (as indicated by equal radius lines). Evidence is lacking for a regional centre within the Corinth region at this period, and it is surely as a supra-regional centre that Mycenae flourished in its particular location.

suspected settlement site and its associated field area, resulted in some insights into settlement behaviour.

Both principles assist the interpretation of a dense survey map of an obscure gorge in southern Crete, the Agiofarango. In the Early (EM) and Middle (MM) Minoan (Bronze Age) periods which these maps cover, the most frequent site in this admirably intensive survey (Branigan and Blackman) is a small stone-built tomb—a

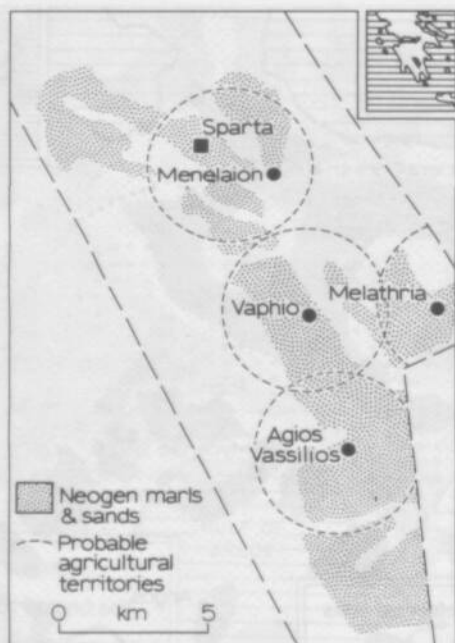


FIG. 16. The distribution of the key Neogen sands and marls and major Mycenaean centres in the Sparta Plain. While the centres of Vaphio, Agios Vassilios and Melathria appear to occupy a central location with maximum access to the preferred soil that they dominate, the regional centre at the Menelaion is slightly off-centre to its suspected arable territory. Its successor, the ancient and modern regional centre at Sparta itself down in the plain, is far better placed than the lofty Menelaion for agricultural accessibility to roughly the same area of fields. As was seen in Fig. 2B, the location of the Menelaion takes advantage of a spectacular plateau edge platform, chosen for a Mycenaean palace partly for defence, partly for its eye-catching and picturesque prominence (cf. Phaistos in Crete), but with a definite dominance over a major zone of high quality land. Possibly the farming sector of the Menelaion centre actually lived below in the fields, leaving the centre itself for the elite (cf. Fig. 2A, 2C). The map suggests fruitful areas for archaeological survey to the north-west and south of the known centres.

lowly ancestor of the later giant Mycenaean tholoi. In fact in this whole region, (the Messara Plain and its surrounding hills), nearly all prehistoric locations of this date consist of these tombs, hardly any substantial settlements being recorded (Fig. 18).

It is apparent that the tombs correlate with localized patches of good soil, as do later settlements in the valley. The tombs are known to be in use contemporaneously through most of these two

Minoan periods, and cannot (as some hold) represent, each one, a nearby village, since field calculations prove that each associated arable patch can barely support a few families. As in the Argolid, till recently one nucleated village farmed the whole area.

We suggest that the arable land of the gorge is split up into holdings, associated with a particular kin line. The ancestors of each 'extended family' are buried beside a particular family holding.

Very few of such tombs have been excavated, but where burials have been approximately calculated, a comparison of the number of dead with the duration of use of the tomb, from the pottery and other artefacts, provides us with a reasonable figure of two to four families owning the tomb, and by inference the arable holding, at any one time. The proportions of bones of different age-groups also suggests that all dead community members were interred here.

We find then a parallel pattern to the small EBA farm sites on the mainland, though on Crete there is no noticeable decline of emphasis on the dispersed holding in the MBA.

Where people were actually living in EM and MM times is less clear; there are possible farmstead traces along the valley, and perhaps a village site beside the most extensive of the marl soil patches.

Further confirmation for the family nature of the tombs can be found in their distribution, north of the Agiofarango, in the Messara Plain. Here they are so dense, both in comparison to available land and known settlements, as also to present day village territories, that the hypothesis of one tomb per village can be ruled out. Occasionally, a lone Minoan house near the tomb may represent the family cultivating base of a seasonal or permanent nature.

It seems probable, then, that the Early and Middle Minoan phases on Crete and much of the Early Bronze Age period on the mainland, were times of relative security and a strong emphasis on local kin and cultivation. Similar evidence comes from the Cycladic islands, especially for the Early Cycladic period—when the commonest archaeological site is a small group of burials, that can generally be linked to an 'island' of good soil amid the considerable prevalent expanses of rock and sandy soil (*cf.* Figs 3A and 4C).

Recent parallels abound in traditional island life. On Melos, for

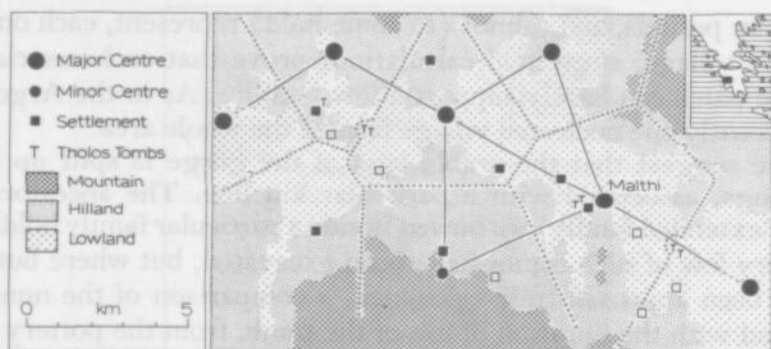


FIG. 17.

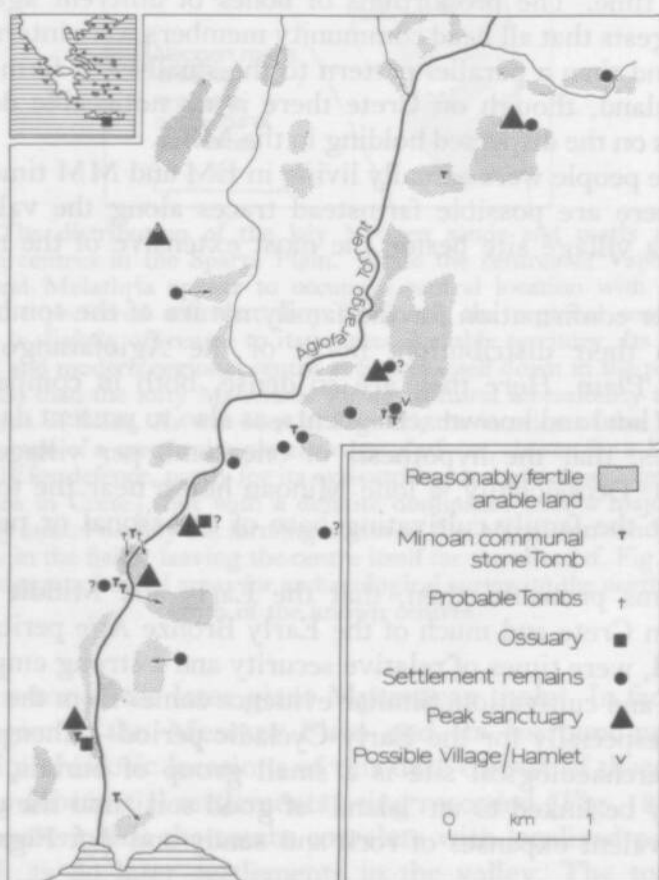


FIG. 18.

example, till very recently, collective village burial was unknown and each family buried its kin by one of the field holdings. Almost all of these discrete areas of good land have an associated chapel, which acted as the centre for burial and ancestor worship for local cultivators. At least 200 of these chapels survive on Melos today.

The same evidence regarding ancient and modern settlements can be demonstrated on Mykonos, and could be shown for other islands of the Archipelago.¹⁰

It is again from ethnography that plausible mechanisms can be extracted to aid the reconstruction of social life in prehistory. A fishing network could introduce a new awareness of wider horizons and different human groups, at the same time providing a way in which material and ideas can circulate in a non-commercial economy. That fishermen are traditionally part-time and spent much of the year as agriculturalists, points up the extent of travel and exchange possible, even within what could well be 'acephalous' self-sufficient economic communities.

Short- and long-distance transhumance with sheep and goats, found throughout Greece, and documented in ancient times, can probably also be assumed for the remotest prehistoric periods as an integrator and medium of cultural and material exchange.

FIG. 17. A pilot study to demonstrate the feasibility of using data from the Minnesota Messenia Survey to establish networks of Mycenaean centres spaced at regular intervals and comparable to Fig. 13 and 14. The best known site in this area (Soulima Valley) is that of Malthi. The major centres are linked by single-lines of apparently regular length; two centres are located just off the mapped area and two close sites both considered major by UMME have been amalgamated. Definite settlements: solid squares, uncertain: open. Suggested territories for major centres are indicated by the broken lines. Only map distances are shown, and walking times are not available; however the lower apparent map distance between major sites in comparison to that seen in Figs 13 and 14 is almost certainly due to the particularly uneven topography of the Soulima Valley, thus increasing the actual walking time for each mapped kilometre separating sites, although one should be very cautious in generalizing from this particular exercise.

FIG. 18. The distribution of the Early and Middle Minoan (Bronze Age) findspots in the Agiofarango Gorge, south Crete. The main torrent and its tributary run approximately north to south across the map to the sea. With the exception of a possible village/hamlet site at 'V', the settlement traces are more of a farmstead or even temporary field hut nature. Substantial finds stem largely from the communal tombs or Minoan 'tholoi', and the significant relationship of these tombs with particular exposures of arable land is indicated by an arrow wherever the tomb does not actually lie within its associated field plot.

However the rise of elaborate architectural complexes in the EBA, and in the later Palace systems, on Crete and the Mainland, associated with evidence for craft specialization and redistribution networks, suggests a definite degree of centralization from the apparently more 'egalitarian' communities that preceded them.

The background to this repeated phenomenon of emergent complexity in a society is discussed below. What is of interest here is the fashion in which a dispersed community, with or without a central focus, is created and maintained as a functioning group that is aware of itself and shares a common culture.

In a key paper in Chang's *Settlement Archaeology*¹¹ Evon Z. Vogt laid bare the subtle manner in which a region of Mexico achieves renewed integration via religious ceremonial. The modern ceremonial cycle formed a model for the social behaviour of the Pre-Columbian Maya (Fig. 19). In Greek anthropology and folklore, parallels are immediately obvious (Fig. 20).

One of the most striking features of Greek history is the continuity and vitality of Greek traditions, despite continued foreign domination. A key role in this strength of tradition lies in these ceremonial cycles, involving all the able-bodied of the community, and every acre of land—whether plain, mountain slope or sea-coast.¹²

The Minoan communal tombs could plausibly be taken to evince the significance of close-kin-relationships, and the deep ties to local ancestral holdings. If religious ceremonial at these centres of integrating tradition nonetheless tended to further social fission and self-sufficiency, or reflected a prevalent contemporary concentration on such aspects of society, it is equally plain that the rise of Minoan civilization saw a conquest of regionalism and kinship fragmentation by some binding influence. Minoan civilization maintained itself as a distinct form for millennia, and the visible pattern of the palaces demonstrates control over extensive territories with diverse terrain. Minoan palace texts seem closely comparable to those deciphered from later Mycenaean palaces, and suggest a well-ordered economic and political organization radiating from each palace and tapping all the resources within their respective provinces.

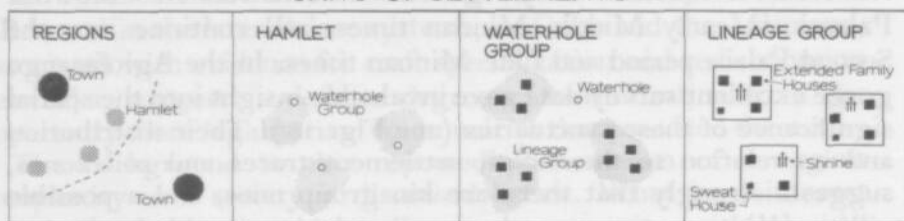
The growing evidence for a widespread system of peak sanctuaries throughout Minoan Crete, is intimately tied up with the

rise of that civilization. They begin with the construction of the First Palaces, in early Middle Minoan times, and continue into the Second Palace period and Late Minoan times. In the Agiofarango gorge excellent survey data gave invaluable insight into the spatial significance of these sanctuaries (see Fig. 18). Their distribution and its relation to the tholoi, settlement traces and soil zones, suggests strongly that there are kin group ones, and a possible village (V) one.

In the larger world beyond the gorge, (Fig. 21), we see evidence for more regional peak sanctuaries on major seasonal-pasture mountains. We can expect to isolate similar sanctuaries beside other villages, and we believe that we are seeing key ritual centres in the regional Minoan palaces themselves.

The comparison of the Mexican traditional, the Greek traditional ritual cycles and the Minoan sanctuary system, prompts the suggestion that Minoan ceremonies were also of an ascending order of public significance. The small knoll sanctuaries along the gorge might be important to extended families who were still burying their ancestors in nearby tholoi; but the sanctuary beside the hamlet or village may have been important for the whole valley. The strong likelihood that summer pastoralism took local shepherds to the Asteroussia peaks suggests that there was a much larger catchment area for that peak sanctuary (on the Asteroussia summit—Kophinas), since many other valley populations have traditionally used that upland zone for grazing. Both the Asteroussia summit site and the Mount Ida (Kamarea) cave and summit peak sanctuary (the latter a grazing focus for a great area of central Crete as far as Knossos), may have been incorporated into large-scale ritual activity organized from the Phaistos Palace, and almost certainly the ritual cycle in and around the Palace itself, drew in, at one time or another, most of the surrounding and presumably subservient population. The duties or even existence of Minoan 'kings' are controversial problems, though a resident elite living in exceptional luxury, and running the political and economic system, seems assured. Traditions concerning the Knossos Palace ruler suggest a sacred kingship, as does the collective evidence in Evans' studies of the Palace of Minos and its religious significance, and the brilliant analysis of the Minoan palaces by J. W. Graham.¹³

UNITS OF SETTLEMENTS



RITUAL MOVEMENTS



FIG. 19. The relationship of settlement and communal ceremonial cycles in the Zinacantan region of Mexico, based on the study of Vogt.

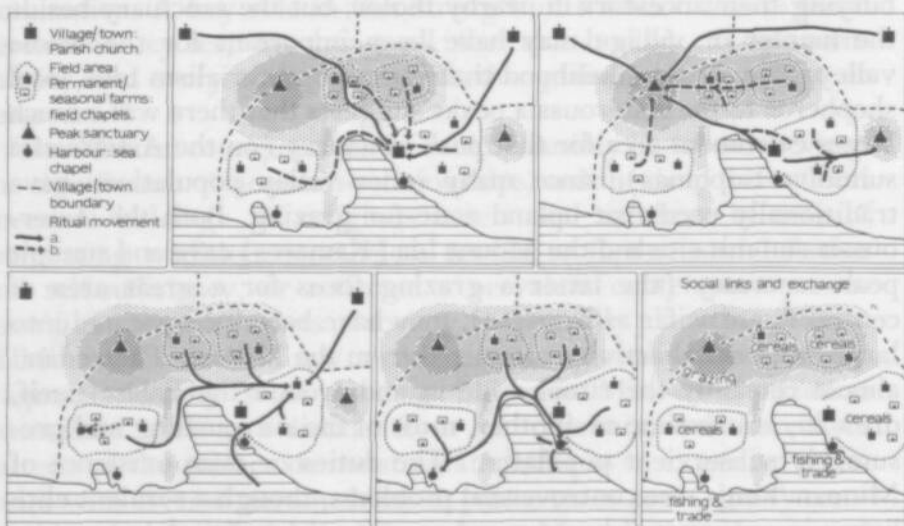


FIG. 20. An idealized local landscape in Greece, illustrating traditional links between communal ceremonial cycles, settlement units and the constituent parts of the traditional economy.

Upper left: Each village has a festival centring upon its parish chapel, attended by occupants of dispersed farms from that village's territory (b routes) and by adjacent villages (a routes).

Upper right: Peak sanctuaries cover most prominent hills and major mountains.

The particular locations of the major shrines, caves and sanctuaries, can be tentatively linked to the nature of the rituals. Sanctuaries of lesser height can be closely linked to associated farming zones, and could involve prayers for crop fertility. Many of the loftier sanctuaries are locations whose only significance is seasonal grazing, and such sites are frequently portrayed in Minoan art with a goddess and goats. Excavations and survey reveal that these summit sites were depositories of figurines of a 'goddess', domestic and wild animals. This sort of coincidence of economic importance and ritual stress is more common than is supposed, and too frequently a 'ritual' explanation for a shrine, just as is the case with 'strategic' locations, is clearly putting the cart before the horse. The whole of the landscape, to the traditional Greek peasant, is alive with religio-economic values—the battle against the devil and destructive forces in general is seen as exemplified in the act of cultivation and renewal of the flocks—harvests of corn and animals are capital won from the forces of evil and based on the original gift of potential fertility to Mankind by God.

The timing of these structures is surely significant, coinciding with the establishment of regional socio-economic centres. The necessary integration was achieved by extending localized cohesive ritual to wider and wider foci of ritual acts.

Within each region one or two have regional significance and attract a wide-spread congregation at their yearly festivals (routes, left). Lesser sanctuaries act as local shrines (routes, right). It is no coincidence that peak shrines frequently dominate grazing zones occupied seasonally at the time of the peak festival.

Lower left: Field chapels are associated with ancestral field plots, and were the traditional burial place for the family, whether normally resident in a village or amid the fields. Each has its festival, of varying human catchment. Sometimes, as with the example on the left of the map, the congregation represents only those who live or have seasonal holdings in the immediate neighbourhood. But on the right we see a field chapel of some veneration; its festival may involve pilgrimages from the whole region and even adjacent regions.

Lower middle: In various ceremonies throughout the year, pilgrimages are made communally in festivals to bless the fishing fleet, the freshwater sources and the ocean. Each harbour and inlet has its chapel with its own festival.

Lower right: Major values particularly localized in the landscape, whose significance to the peasant community is being celebrated in the various ritual pilgrimages described above. At the same time the different units of settlement within the region are affirming their integration and common socio-cultural background.

The Greek mainland and the islands show the same traditional social mechanisms, and there is abundant evidence that regional religious centres ensured integration within definite provinces during the Archaic and Classical periods. Figure 22A shows major examples, some with possible origins in prehistoric sanctuaries. It is much less clear whether a network of regional ritual foci lay at the cohesive heart of the Mycenaean 'Koine' or cultural sphere.

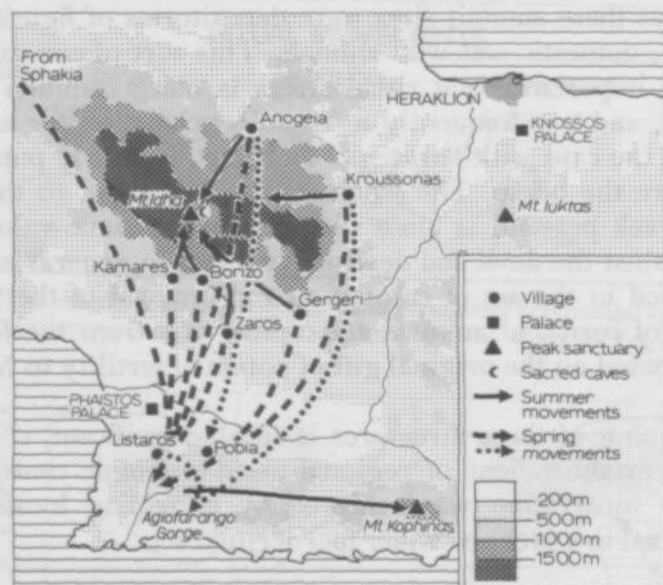


FIG. 21. Central and southern Crete. Above the local level of peak sanctuaries serving individual farmsteads and villages (cf. Fig. 18) regional sanctuaries may be represented by the Minoan sites on the Mt Idha peak, the Mt Iuktas and Kophinas peaks. Significantly the Idha and Kophinas ranges are major summer grazing zones for the surrounding arable lowlands, which in turn once centred upon the major palaces of Phaistos and Knossos. Modern ceremonies at these peaks as Orthodox festivals are naturally during the upland grazing season. Today shepherds from a large number of villages spend the spring in the Agiofarango hills, then summer up in the Idha range; the former villagers of the Agiofarango valley itself, and shepherds from neighbouring valleys, moved with their flocks, in summer, up into the Kophinas range. Source villages for these transhumant moves are indicated on the map, together with the direction of herding movements. We might suggest that similar movements from the lowlands in prehistory were associated with festivals on these major peaks as today; while Mt Iuktas and Mt Kophinas perhaps served only the lowland regions around the Knossos and Phaistos palaces, respectively, it is possible that the Mt Idha peak sanctuary was visited by shepherds and other worshippers from both palace regions as a more 'national' shrine. Pastoral routes from the north-east are not indicated.

Certainly peak sanctuaries and other Minoan shrines appear in Mycenaean art, but this could be simply the contribution of Minoan artistic influences.

However a location discovered on the Argolid Survey has pointed the way to a reappraisal of Mycenaean religion, a Mycenaean peak site near Kranidi, with finds and a topography overwhelmingly suggestive of a peak sanctuary.

A growing number of further sites that may represent Mycenaean peak sanctuaries are often in use as such in Classical times, and are generally found to be modern peak sanctuaries, with a wide human catchment and regional importance (Fig. 22B).

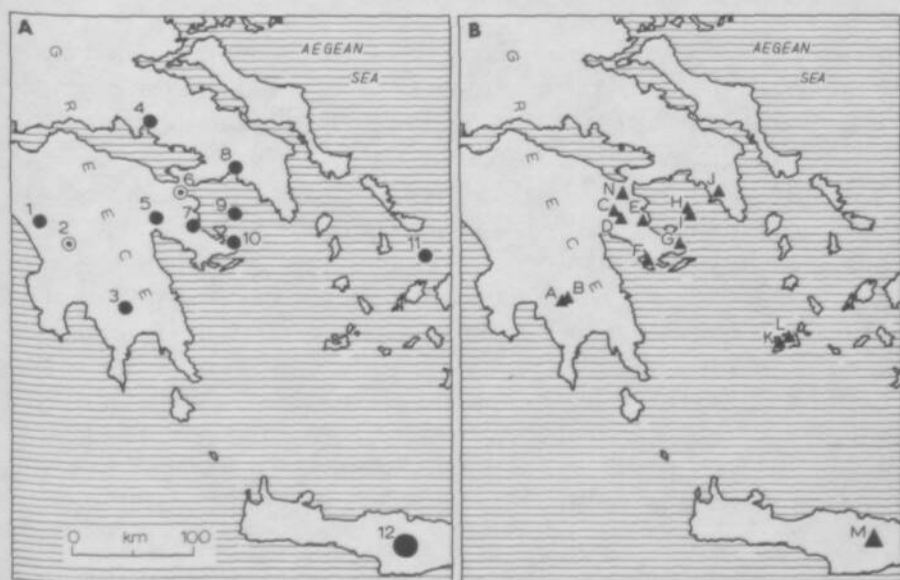


FIG. 22 (A) Major examples of regional and supra-regional ceremonial centres from Archaic and Classical Greece, that served to encourage socio-political and cultural integration within and between the states of the Greek world. Solid circles indicate those with a possible origin in a prehistoric shrine. 1. Olympia; 2. Lynkaion; 3. Amyklaion; 4. Delphi; 5. Heraion; 6. Isthmia; 7. Epidauros; 8. Éleusis; 9. Aegina Oros; 10. Kalauria; 11. Delos; 12. Crete—a notable continuing worship of a communal nature at peak sanctuaries here into historic times.

(B) A. Amyklaion; B. Menelaion; C. Mycenae (Acropolis and Elias peak); D. Heraion; E. Epidauros; F. Kranidi (Argolid Survey); G. Kalauria; H. Aegina Aphaia Temple; I. Aegina Oros; J. Hymettos; K. Melos Agios Spyridon; L. Melos Acropolis; M. Crete—continuity of peak worship into historic times; N. Agia Triadha.

Numerous other possible locations are known on the mainland, and the interpretation of some of them as watchtowers, (recently re-espoused by M. Langdon—in press), needs to be seriously re-examined. Important sanctuaries are recorded in the Linear B tablets of the Pylos Palace, with landed property, slaves and precious wealth.

According to J. Chadwick, (pers. comm.) as our understanding of published Linear B texts deepens, and new tablets appear, the crucial and all-pervading influence of religion to Mycenaean society is becoming very apparent.

Models of Civilizational Growth

In previous sections an analysis has been taken into increasing depth, from the simple requirement of daily bread and the rationale of labour, to the interplay of religion and folk-community awareness within the living landscape.

Finally patterns visible at the regional and national level, will bring us into touch with basic problems in the development of human society. Two aspects of regional political systems are presented as models for the dynamic component in history, the long-term forces activating social and economic growth in Greek lands, and by implication elsewhere.

Archaeologists are preoccupied with the development of differentiation within the socio-economic sphere—the rise of classes, division of labour, the concentration of power and wealth into the hands of a privileged elite. It is clear that this process had already evolved to complex heights by the maturity of the Minoan and Mycenaean civilizations. Professor Renfrew has suggested both a trade model, and a local version of the Coe/Flannery Model for Civilizational Growth. In this scheme, a redistribution from some nodal leader and settlement allows the confederation of landscape zones each with a different resource output, whereby higher culture rests upon the greater economic efficiency of an enlarged community consisting of interdependent smaller communities. Elements of this model are incorporated in the first of our two models.

Evidence is accumulating that both Aegean civilizations arose from stimuli basically internal to southern Greece, and were or-

ganizations almost wholly involved in the redistribution of internal, primarily agricultural, resources. Cretan civilization seems to have owed little to external direction, and it seems likely that the Mycenaeans formed a zone of secondary higher culture very much on Minoan lines, if distinguished by singular interest in militaristic activities.

The Sparta Model

This model may be of future value in structuring the various hints of the forces at work to produce the typical settlement—and social—networks and hierarchies to be found in higher cultures. It is based on the actual historical development of the ancient Spartan state, and may parallel the growth of Mycenaean 'civilization in the same region. Figures 23A and B illustrate the model schematically and particular aspects of the Spartan situation.

These factors in operation are bound to be very significant to the rise and maintenance of higher culture, regardless of whether they give birth to a political elite, (the Mycenaean situation?), or reinforce the status of an *a priori* elite, such as a dominant group of external invaders (the Dorians to Sparta, the Spartans to Messenia and Helos).

The Monastery Model

Linked to the previous model, this model isolates another particularly recurrent element, with a possible causative function in the formulation of elite groups and complex stratified societies. An historical study of monastic establishments throughout Greece demonstrates forcibly how a religious minority grew to control most of the land and people of a country, by factors apparently intrinsic to their religious foundations. The following reconstruction is applicable in very general terms to most countries of Europe, and covers the period from later Roman times to the Late Middle Ages.

The original monastic impetus was the desire to dwell alone, or in dispersed groups loosely focussed around a chapel—a life of prayer and simple labour. Frequently a wilderness was chosen, and little effort made to maintain regular contact with the outside

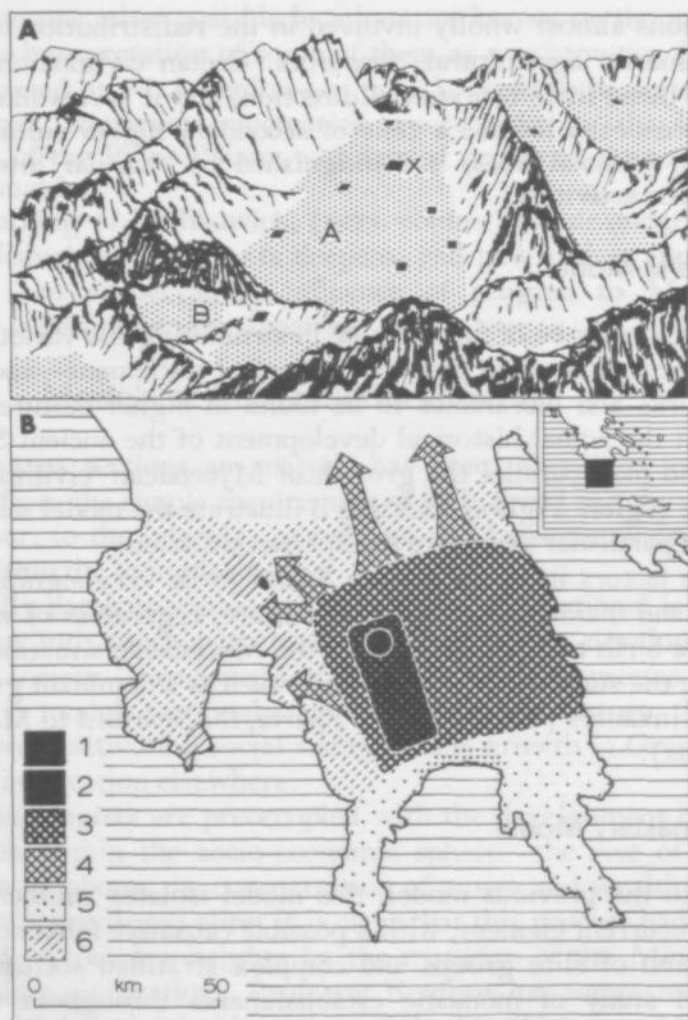


FIG. 23A. An idealized landscape and settlement pattern, based upon the main features of the historic landscape and settlement system of ancient Sparta. The fertile lowland plain is shown as the A zone, with X marking the regional centre; amongst the extensive surrounding mountains and hills (C) are to be seen numerous discrete areas of arable land e.g. patch B; all settlements are shown as in examples, X a lowland town, and Y an upland village.

If we contrast the upland settlements and their available land with the lowland plain communities, certain theoretical conclusions may be drawn for developmental tendencies:

1. The soil is of better quality, and more level, in the lowland thus there is greater return per given area.
2. There is more reasonable soil per sq. km of lowland thus a denser population is supportable.

world. At some point in many areas of Christendom, a subtle change occurred, whereby groups of monks chose a more communal life, and a rudimentary division of labour arose to ensure a continually adequate food and equipment supply. With the more

3. Greater per acre returns, thus a smaller holding size is required for self-sufficiency of farmer and this is a further factor increasing population density.

4. Smaller average holding, thus the possibility of surplus of labour arises particularly in lowlands. This extra time for the farmer might be consumed in two main ways: a. further holding may be worked, and this crop exchanged for imported goods, the products of local craftsmen, or the assistance of farmhands; b. with the surplus available via 'a', specialist artisans and administrators/priests may be maintained in the lowlands, ultimately full-time; an intermediate stage might see such roles carried out on a part-time basis with the occupant primarily self-supporting.

5. Denser lowland population, thus there is more purchasing power, and more concentrated demand for created products and imports, as well as more concentrated demand for political and legal 'servicing'. By the law of The Range of a Good the threshold required from local demand to support local centres of artefact production, distribution of imports, and politico-legal servicing, is likely to be first crossed in the dense and mutually accessible lowland community. This establishment in the lowlands provides feedback to the potential for specialization there as in 4b.

6. The lowland is the natural location of regional administration and community activity, being generally the area of easiest communication both within the region and with other regions, and also representing a major proportion (if not the majority) of the regional population total.

FIG. 23B. The development of the ancient Spartan state demonstrates the natural dominance of the 'core-area' of the Sparta Plain, a perhaps predictable conquest or amalgamation of adjacent fertile core-areas, and proof of the concept that to occupy the core-area of a region is sufficient to occupy all of a region. Stage 1: Dorian invaders take over one of the most fertile segments of the Sparta lowlands—the environs of Sparta town itself.

2: All the lowland is conquered from its most fertile sector.

3: The Dorians and indigenous peoples who occupy the poorer uplands around the major lowland area are incorporated with subservient status into an enlarged Spartan state—actual occupation by the Sparta lowlanders not required.

4: The commencement of recurrent conflicts with the forces of adjacent and similarly expansive core-areas for control over intervening zones of lower fertility and lower population, e.g. against Argos over Kynouria, the Arcadian cities over Skiritis, Messenia over the Denthelites.

5: The adjacent core-area of the Helos Plain is annexed by conquest to the Spartan state, providing more high quality land and accessible harbours. Again actual occupation by Spartans is confined to the Helos Plain (indicated by closer area dots), though all the remaining poorer lands of south Laconia come under Spartan control.

6: The adjacent region of Messenia is annexed by conquest to the Spartan state. Only the most fertile areas appear to come under the immediate occupation of Spartans, probably those five indicated by shaded zones.

than average intelligence of the leading monks, their accumulated knowledge of texts on agricultural methods and economics, even the most barren wilderness flowered for the fathers. As noted earlier, the act of cultivation has more often than not been an act of duty and worship.

As the turn to such a life grew in popularity, the power of the secular authorities was declining. The general collapse of many formerly powerful political systems and their economic networks, led to great numbers of people flocking to the secure world of the monasteries, and the secular powers, also, became aware of the relative prosperity of these swiftly multiplying institutions—which acted as balanced, almost self-sufficient centres of production and consumption over the landscape. The monks were given increasingly larger gifts of land to recolonize, as their numbers swelled, and each monastery 'gave birth' to many others; ultimately whole groups of surrounding villages came into a monastery's formal possession. Figure 24 illustrates a schematic plan of the monastery 'system'—dependent villages and sub-monasteries, food and material chains.

The reaction of the peasantry was probably generally favourable. Under the monastery they enjoyed security of subsistence and employment, protection from secular demands and marauders. Furthermore the monasteries set up sophisticated networks for the movement of raw materials and finished goods, at first for necessary utensils, but later to compete with the spiralling demand for the monastery specialist products—woollen cloth, wines. These simple and sophisticated products were distributed to surrounding populations at religious fairs, often held outside the monastery, and the occasion for social and spiritual integration ceremonies as well as the more obviously economic integration. The monastic workshops were the great centres of fine arts, while the literacy of the monks was no less developed in meticulous estate accounts than in the better-known manuscript work. Opportunities for promotion, and responsibility over great areas of land, encouraged a career in the Church for many who in previous centuries would have held high civil posts. For the lesser mortals, the protection against famine and shortage of materials and markets was ensured by the widespread economic links that existed throughout the monastic system; the ritual cycles covering ceremonial activities

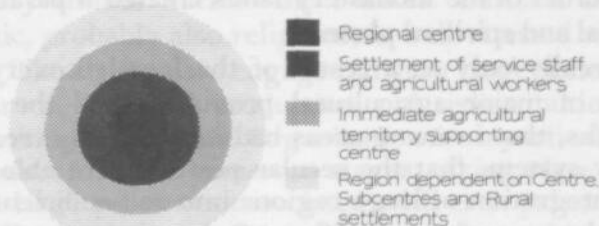


FIG. 24. Notes on the different levels of the Monastery/Palace system: (the scheme applies to both systems, see p. 110 and Fig. 25).

Regional centre: settlement of the elite who deal with the administration of the region,—politically, economically and spiritually. Centre of art and crafts, regional ritual; centre of import and export, and main consumption area of luxury goods (cf. Figs 2C, 4C, 13B, 16, 21).

Settlement of service staff and agricultural workers: associated with the centre, residence of those that maintain the elite settlement and its occupants, as servants, lower craftsmen and cultivators of the immediate surrounding lands (cf. Figs 2A and C).

Immediate territory of the centre: a significant body of fertile arable and/or grazing land, accessible to those servicing the centre and providing its main source of nourishment (cf. Figs 13B, 14B, 16 and 17).

Region of centre: dependent and associated settlements and subcentres: larger region dependent on the centre. Villages, hamlets and dispersed farms, varied agricultural and raw material resources sufficient to maintain regional population and elite (rulers and specialists), as well as providing a surplus for outside exchange. Administered by local 'branches' of the central organization: in the Monastery system for example by dependent smaller monastic foundations; in Minoan Crete probably by both the staff of the country villas and village officials maintained by the palaces; in Mycenaean Greece probably by mayors of dependent villages and hamlets, and district aristocrats dependent on the palaces. Integration furthered on the ritual level by: in the Monastery and Minoan systems—frequent communal ceremonies at the centres and at lesser religious foundations, and at other sacred sites (peak sanctuaries, sacred caves, field chapels), and possibly at the Minoan villas; in Mycenaean Greece perhaps by communal ritual at major and minor centres, shrines in lesser settlements, sacred sites (peak sanctuaries, cave shrines, 'temple communities'—as suggested by the Linear Tablets) (cf. Figs 4C, 13B, 14B, 15B, 16, 17, 21, 23A, B).

Other regions and their centres, dependent settlements: close links between the elites of each regional centre enable exchange of products between regions, cooperation for outside activities (trade, defence). Communal worship at shrines sacred to more than one region may reinforce intra- and inter-regional uniformity of belief and social structure. Ultimately amalgamation may be completed e.g. by elite intermarriage, interchange or conquest (as with the Mycenaean dynasts, the mobility of the higher Monastic priesthood, the conquest policy of the Spartans).

on every corner of the monastery lands created a parallel security on the social and spiritual plane.

It was really only as a result of the local recovery and even prosperity of major agricultural provinces, and the wide commercial links, that in many areas had been largely created by the Monastery system, that the secular powers were able to achieve ultimate integration of large regions into self-sufficient kingdoms and towns began to form significant foci again, and once these two secular forces were re-established, rather naturally, they began to struggle to lessen the Church's hold on the land and the trade, as also the Church's rights over the laws as they applied to Church dependents. This development should be seen as a predictable one, and is closely comparable to the sequence proposed by Adams for civilizational growth in early Mesopotamia and Mesoamerica—Sacred Economy State (which really puts higher civilization 'on its feet' and gives its early stages a characteristic stamp), ultimately overtaken by more secular forms of the State (with a dominant characteristic of expansive militarism).¹⁴

The key importance of the Monastery or Sacred Economy Stage, is to forge strong links on many levels, between large numbers of people living in different areas, and between different natural regions. The stage occurs either at a very primitive period, or after a cataclysm—when entropy is in danger of disintegrating all but the most local and familial ties, and higher culture of craft or art is all but lost. The cement of this integration process, working outwards from nuclear cells of concentrated elitist organization, is religion; for it is the creation of the Holy City on earth that fundamentally inspired the sophisticated web of the Monastery system, both in its monastic leadership and its co-operating subservient populations. If this ideal became blatantly perverted in the course of time it is really the inevitable consequence of the remarkable efficiency of the organization, and its unconscious take-off from consistent self-sufficiency to commercial profiteering on an international scale.

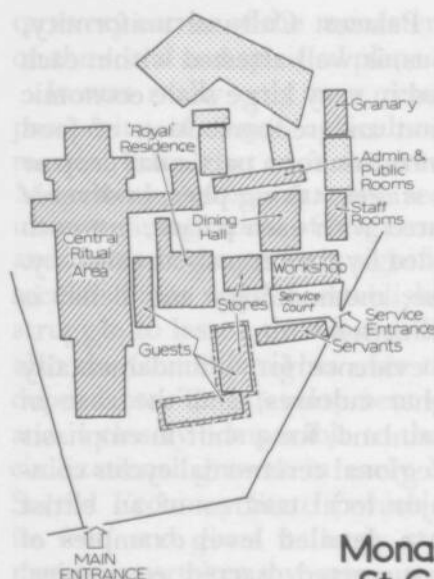
When we consider the archaeological evidence for the organization of the Minoan and Mycenaean civilizations, we realize we are not prepared—if we had only read Homer. The major novelty is the existence of an all-embracing bureaucracy of great uniformity, radiating authority and complex economic instructions from a

series of very similar nuclei—the Palaces. Cultural uniformity, and linguistic, probably also religious, is well-attested within each civilization. The Palaces are engaged in very large scale economic projects, for the regional production and redistribution of food supplies, clothing and metals. Organization for a particular crop or finished product involves numerous stages, taking place in diverse areas of the large provinces associated with each palace, but each stage carefully monitored and recorded by the central bureaucracy. A tremendous harmony of purpose, methodology and belief is manifest by the maturity of each civilization.

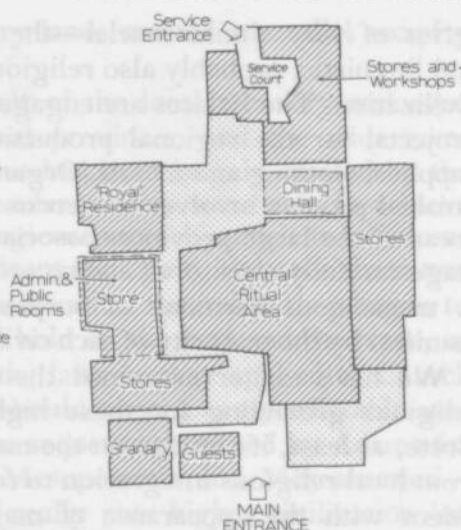
We have earlier examined the evidence for a fundamentally religious grounding for these higher cultures, and the case in Crete, at least, if not also on the mainland, for a shift in emphasis from local religious integration to regional ceremonial cycles coincident with the appearance of major local centres of an elitist nature. In Fig. 25 we compare at a detailed level examples of regional centres for definite and suspected 'sacred economies' drawn from diverse backgrounds in areas and time (and *cf.* also the comparison in Fig. 24).

It is my hypothesis, that future research will demonstrate how the development of sacred economies preceded and paved the way for the mature civilizations in the Aegean. Some centralization of ritual powers may already have occurred with the 'proto-palaces' in Crete and on the mainland, during the EBA, and it is possible that the influence of these foci had already begun to integrate diverse areas within local socio-economic confederacies, cemented by supra-village religious ceremonial. Perhaps these early foci, (as the mature Palaces), were the equivalent of the Mesoamerican Ceremonial Centres, with a staff drawn from the ritual leaders of surrounding communities.¹⁵ On the mainland there was no natural development into the Mycenaean civilization, but in Crete the 'proto-palaces' seem to have developed into the more elaborate and probably more politically powerful First Palaces. When the Mainland did, tardily, achieve its mature civilization, the Mycenaean, it certainly seems modelled on Minoan lines, but there is a difference. The Minoan expanded outside of Crete, in apparently peaceful fashion, but the Mycenaean expansion—amongst other places—onto Crete itself, is typified by an emphasis on militarism.

Abbey of Cluny



Minoan Palace of Mallia



Monastery of St Gall

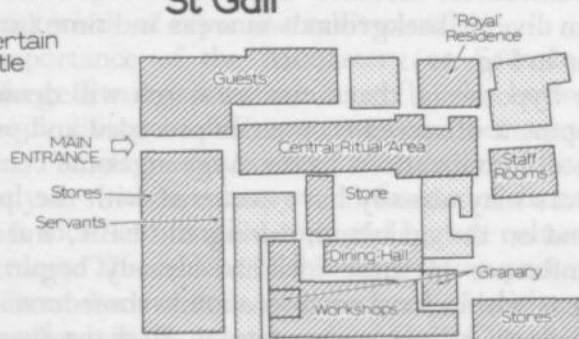


FIG. 25. Comparison of three building complexes that are typical examples of regional centres in Europe during periods when urbanism was either non-existent or of only local significance. In many regions we can point to such centres as the summit of a hierarchy comprising, in addition, numerous dependent villages and farmsteads. In their main functional parts close similarities may be observed. Dotted areas are either of uncertain function or of little significance to the comparison. Even details of access routes and the relative importance of individual shared component parts correspond well. All centres have in common a major ritual area (serving the whole region serviced and ruled by the centre); an elaborate residence for the head of the ruling elite; guests quarters; very extensive storage facilities in which are kept contributions from the harvests of dependent villages, both for the maintenance of the centre and for redistribution to its local agents; important workshops, where we would find both the regional centre for fine arts and a concentrated production of practical artefacts for supplying the surrounding rural population.

These architectural complexes then combine the features of a 'prototown' with those of a 'ceremonial centre' within their region; the example top left is the Abbey of Cluny, bottom centre the Monastery of St Gall (both early Mediaeval from central Europe); the example on the right is the Minoan palace of Mallia on Crete (following the functional analysis of J. W. Graham (1969).

The Palaces of Crete).

This militaristic aspect is reminiscent of the Adams scheme, and just as with the examples in his study, Mycenaean militaristic expansion did not result in a similar degree of success in regional integration, compared to the careful integration of sympathy and feeling that one is inclined to attribute to the Sacred Economy. The attempt to make Knossos a centre for the occupying Mycenaean warriors was given up after a relatively brief time, and it is likely that the Mycenaeans withdrew from the island. If the Trojan Expedition is as real as Professor Blegen has always maintained, this also seems to have been a brutal attempt at expansion into adjacent and rival spheres of influence, that brought no lasting wider Empire; the Mycenaeans withdrew and very shortly afterwards their higher culture disintegrated in its own homeland.

In many parts of the world, archaeologists are beginning to tackle the crucial transition from simple farming communities to major state units. It is conceivable that the factors isolated in these two growth models will prove to describe essential and decisive elements in the Civilizational Process for areas widely separated in time and space.

3. Notes

1. See particularly C. Vita-Finzi and E. S. Higgs, *Proceedings of the Prehistoric Society*, 36 (1970), 1-37.
2. C. Renfrew, *The Emergence of Civilisation*. London (1972).
3. C. Vita-Finzi, *The Mediterranean Valleys*. Cambridge (1969).
4. For example, cf. D. Hafemann, *Die Umschau*, 60 (1960), 193-196.
5. N. C. Flemming *et al.*, 'Eustatic and tectonic components of relative sea level change' in *Marine Archaeology*, ed. D. Blackman, Bristol (1973), p. 1.
6. Pollen evidence and historical records are consistent on this point from northern Greece (mainly the work of Bottema), and from Messenia (discussed in the Minnesota survey volume). Historical data, particularly the descriptions of recent travellers, corroborate this picture for most other regions of Greece. However, the newly published interpretation of a core from Lake Copais, in central Greece, may indicate a local occurrence of early and progressive deforestation, but we lack reliable dating for events in this core, and the reconstruction as published takes no account of fluctuating lake levels or the exact origin zone of the pollen. It is not impossible

- that the draining of the Copais plain for agriculture, perhaps by the Mycenaean, and a later infill of moist treeless alluvium, is represented in this core, rather than deforestation of surrounding hills. (J. Turner and J. Greig (*Journal of Archaeological Science*, 1 (2) (1974), 177.)
7. H. H. Lamb, *The Changing Climate*. London (1966).
 8. G. R. Rapp and W. M. McDonald (eds), *The Minnesota Messenia Expedition*. Minneapolis (1972).
 9. R. Hope-Simpson, *A Gazetteer and Atlas of Mycenaean Sites*. London (1965).
 10. Since this study was composed Professor Renfrew has isolated communal tomb/family holding groups amongst the megalithic tombs of the Scottish isles, at a similar scale to our Greek examples: C. Renfrew, *Before Civilisation*. New York (1973).
 11. K. C. Chang, *Settlement Archaeology*. Palo Alto, California (1968).
 12. Nonetheless one must stress the likelihood of recurrent independent 'invention' of such integrative practices. It is not essential, indeed unlikely, that communal ritual e.g. at sacred peaks has continued unbroken from prehistory to the present-day at particular locations. It is surely the appropriateness of certain locations for ritual, given relatively unchanging human involvement with success of upland grazing, field holdings, fishing inter- and intra-village social links, that provides the essential basis for the recurrence of these 'landscape ceremonies'. This is not to deny that memory may survive, even though there are hiatuses in the deposition of ritual offerings. But it is the continuing relevance of the location to new cultures in their everyday life, rather than tradition *per se*, that seems the crucial factor to the present writer.
 13. J. W. Graham, *The Palaces of Crete*. Princeton (1969).
 14. R. M. Adams, *The Evolution of Urban Society*. Chicago (1966).
 15. Here again, since the completion of this paper, Professor Renfrew (1973 *op. cit.*) has pointed to regular spacings of the prehistoric Maltese temples, each relating to a major zone of arable land—were these also the scene of local integration ceremonies for the surrounding population?